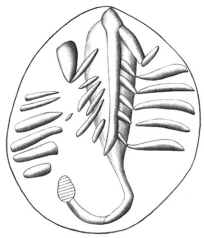
CORPUS DER
MINOISCHEN UND MYKENISCHEN SIEGEL

Beiheft 10

CORPUS DER
MINOISCHEN UND MYKENISCHEN SIEGEL

BEIHEFT 10



RUPRECHT-KARLS-UNIVERSITÄT HEIDELBERG
INSTITUT FÜR KLASSISCHE ARCHÄOLOGIE

CORPUS DER MINOISCHEN UND MYKENISCHEN SIEGEL

Founded by
FRIEDRICH MATZ

Continued and expanded by
INGO PINI

Series editors
MARIA ANASTASIADOU, OLGA KRZYSZKOWSKA, DIAMANTIS PANAGIOTOPOULOS

BEIHEFT 10

Seals, Sealings and Seal Impressions from Akrotiri in Thera

ARTEMIS KARNAVA

Volume editor
MARIA ANASTASIADOU

SEALS, SEALINGS AND SEAL IMPRESSIONS FROM AKROTIRI IN THERA

by
ARTEMIS KARNAVA

CMS Heidelberg

Research results from Austrian Science Fund (*FWF*): M 1427
Published with the support of the Austrian Science Fund (*FWF*): PUB 303

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at http://dnb.dnb.de.

Digital edition published at Propylaeum
Heidelberg University Library 2018

This publication is freely available (Open Access) at
http://www.propylaeum.de and
https://e-book.fwf.ac.at
URN: urn:nbn:de:bsz:16-propylaeum-ebook-372-5
DOI: https://doi.org/10.11588/propylaeum.372.529

The printed edition is available at
www.cmsheidelberg.uni-hd.de

Frontispiece: Drawing of a seal impression with a scorpion impressed on the pithos rim Akrotiri A8534 (**I2**)
Copy-editing: Maria Anastasiadou, Olga Krzyszkowska
Configuration of figures: Maria Anastasiadou
Typeset by: Nikos Valasiadis
Typeset in: Minion Pro
Printed by: Strauss GmbH

ISBN 978-3-947450-06-0 (PDF)
ISBN 978-3-00-060832-2 (Hardcover)

To the tribes of inhabitants and excavators of Akrotiri, past and present

TABLE OF CONTENTS

FOREWORD BY THE SERIES EDITORS

The prehistoric site of Akrotiri is of immense significance for understanding the Bronze Age Aegean. In an ironic circumstance, the ferocious volcanic explosion that annihilated all life in the flourishing prehistoric town three and a half millennia ago was the very factor that preserved its material remains for us by cushioning them in a thick layer of volcanic ash. As a result of this, Akrotiri is the best preserved Bronze Age town in the Aegean and a key site for understanding life in prehistoric times.

From the moment that we encountered the work of Artemis Karnava on the seals and impressed objects from Akrotiri we recognized that this study was appropriate for publication in the *CMS* Series. The Akrotiri material comes from a singular site and was well protected from external interference from the time of its final deposition to the time of its discovery. This circumstance offers an unparalleled opportunity for better understanding the significance of seals and sealings for the inhabitants of the Bronze Age Aegean. All seals and objects with seal impressions in Akrotiri come with a 'bonus' that is critical for comprehending the role that seals played in Bronze Age societies: they originate from well-documented 'residential' contexts which offer a vibrant image of life during the town's last hours. Karnava takes us through the discovery process of each piece and discusses in detail its find circumstances in a way that offers rare glimpses into the role that seals played in Akrotiri's everyday life. The distinctive character of the material and its recovery in closed contexts have allowed the author to make clear distinctions between imported and locally-made material. On this basis, she has been able to provide evidence both for the significance of seals to the residents of Bronze Age Akrotiri and for their contacts with other Aegean sites, most notably, with Neopalatial Crete. Of critical importance for studies of Aegean administration is the fact that the majority of impressed nodules comes from a single context and belong to one nodule-type, the flat-based variety. This unique circumstance has provided the author with critical insights into the processes by which this material was accumulated in Akrotiri. Most importantly, it has enabled her to trace in the archaeological record seal users of different ranking who were active in a hierarchical administrative system attested in both Crete and Akrotiri during the Minoan Neopalatial period.

This volume is the first of a new *CMS* Series that is being produced at the Institute of Classical Archaeology in Heidelberg following the relocation of the *CMS* Archive from Marburg in 2011. The new volumes are heavily reliant on the traditions established by the *CMS* in Marburg in respect of high quality documentation and presentation of the material. They are, however, also different in several ways which are meant to signify a new beginning and also make the series better adapted to the needs of our time. The most important change is related to the form of the series which will, from now on, be available as an Open Access digital publication. The decision to transform the series into a digital publication is related to financial and practical considerations. At a time when funding for the humanities is drastically diminishing, it is crucial to explore viable solutions that will guarantee the sustainability of this project, whose critical significance for the study of the Aegean Bronze Age is undeniable. Moreover, at a time when knowledge is being disseminated at an incredibly high speed through the web, one of our main concerns has been to find a way for the series to offer 'knowledge for all'. It is this same concern that

has also led us to adopt English as the series language. By offering us the possibility of integrating the series in Propylaeum Publishing, the University Library of Heidelberg guarantees both the continuation of the *CMS* Series in the future and the dissemination of knowledge produced by it.

However, in addition to the digital version, the volume will also be available in a printed edition, corresponding to the standards of previous *CMS* volumes. This will be an essential addition to the collections of specialized institutional libraries and will be welcomed by readers who do not wish to rely solely on a digital publication.

The publication of this volume would not have been possible without the support of a number of institutions and individuals, whom we cordially thank here. The Austrian *Fonds zur Förderung der wissenschaftlichen Forschung* has provided the financial support that enabled us to prepare the volume for publication. The Museum of Prehistoric Thera and the Akrotiri Excavations provided the permit for M. Anastasiadou to handle and photograph material held at their premises. A. Devetzi has been particularly helpful during the visits to the premises of the Akrotiri Excavations. J. Bennet and C. Macdonald provided reviews at an initial stage in the preparation of this volume. S. Lieberknecht, V. Ronchi and A. Theodoropoulou are responsible for the drawings published in this book. A number of research assistants have been charged with various tasks relating to the volume: D. Wolf, D. Antypas, S. Tuppat and A. Scognamiglio. The contribution of D. Wolf has been particularly valuable as she has also worked on the manuscript consistently during the work-laden summer of 2018 when the final preparations for the publication were being made. Finally, N. Valasiadis set up the book for publication.

We sincerely hope that the new *CMS* volumes will live up to the high standards set by the old series but will also expand it in ways that provide good responses to the challenges of our times. Time will only tell if our intentions meet with success.

Maria Anastasiadou – Olga Krzyszkowska – Diamantis Panagiotopoulos

FOREWORD BY THE DIRECTOR OF THE EXCAVATION

The torrent that cut down through the volcanic ash, as it flowed through the prehistoric city at Akrotiri, flooded the rooms of the buildings, trapping their content in the mud. This was the picture revealed by the excavation in the east wing of Complex Delta (Δ), only a small part of which has been preserved, thanks to a dry-stone retaining wall built by the farmers in modern times.

A partition wall that separated Room D18 into two parts, south (D18a) and north (D18b), helped to keep the ceiling in place at the east edge of the room. Very close to the ceiling of Room D18b, near the SE corner, a cache of clay sealings was found. Perhaps these had been kept in some container of organic material — long-perished — which had floated upwards on the waterborne sludge.

In the present volume, Dr Artemis Karnava discusses exhaustively not only these sealings but also all the sporadic finds relating to sphragistics, recovered from the excavations at Akrotiri. With this study, another piece comes to fill in the puzzle of the history of Theran society in the Bronze Age.

As Director of the Akrotiri Excavations, I take this opportunity to congratulate Artemis on her sound scholarship and her responsible treatment of the sensitive material I entrusted to her.

Christos G. Doumas

ACKNOWLEDGEMENTS

This monograph on the seals and seal-related material from Akrotiri is the conclusion of my involvement with the excavation over many years. I arrived at Akrotiri on October 2000 in order to participate in the excavation for the pillar pits for the new shelter of the site, with absolutely no idea of how my involvement would develop in subsequent years. First and foremost C. Doumas, director of the excavation, is to be thanked for entrusting me with this material, which, even amidst the abundant archaeological material that Akrotiri has generated, stands out and is fundamental for our understanding of the latest phase in the life of the settlement. In addition, on a personal level, his and his family's hospitality and warmth have been a steady reference point in my life. Throughout the excavation and in the following years the precious friendships and collaborations that arose from my belonging to the wider Akrotiri Excavations family have been unique and irreplaceable, and this is all thanks to him as the head of this family. Akrotiri took me on a journey that began in Santorini, with stop overs in Athens, Crete, Marburg and Oxford, took me to Vienna and had me land in Heidelberg, where my manuscript found a welcoming home.

The conservation of the clay sealings had already been completed when I first handled them in 2003. The craftsmanship of the late conservator I. Michailides, who undertook the on-site recovery, and that of the conservators P. Aggelides, S. Dimopoulou and V. Dimitropoulos, who later undertook their meticulous assembling in the conservation lab, is to be thanked for the excellent state of preservation and survival of this fragile material. The excavation photographer D. Sakatzis is responsible for a number of the photographs of seals and sealings taken at my request, especially of the back and the generally neglected sides of these objects. To A. Devetzi, L. Valassi and S. Vakirtzi I extend my warmest thanks, since they doubled in their capacity of administrative and archaeological staff of the excavation offices and archives; to A. Devetzi, I am also indebted for her patience in discussing matters pertaining to archaeological contexts and her invaluable assistance in identifying seal stone materials.

My study benefitted enormously from the examination of comparative material (Neopalatial Cretan sealings from a number of different sites in Crete) in the Museum of Herakleion (2009), the Chania Ephorate of Antiquities (2010), as well as the Ashmolean Museum in Oxford (2014). The directors and staff of the respective institutions are to be thanked for allowing me access and for facilitating my study in every possible way. My indebtedness extends naturally to the Ephorate of Antiquities of the Cyclades, and in particular the archaeologist M. Efstathiou, for allowing me (and, in due course, also M. Anastasiadou) to examine and photograph the Akrotiri material in their care, on repeated occasions both in the Museum of Prehistoric Thera in Fira as well as in the excavation storerooms. Finally, I am and will remain grateful to the late P. Carlier, through whose decisive intervention I was granted access to visit the Law University Library of the University of Nancy in France (2010), where manuscripts, drawings and photographs of finds from the French excavations at Akrotiri in the 19th century are to be found as part of the personal archive of É. Burnouf, then director of the French School; the further intervention of F. Rougemont, P. Darcque and A. Boucher also secured me access to copies of the manuscripts.

My gratitude to the *CMS* teams, past and present, are beyond words. I. Pini and W. Müller, the previous editors of the *CMS* series, graciously hosted me at the *CMS* Archive in Marburg in the summer of 2003, when I was granted permission to study the material; it was then that I first came into real contact with the world of seals and realized the relentless requirements for their study. Each generation would like to think that it is more astute and perceptive than the previous one, or than all previous generations, for that matter; but one would make a poor beginning had it not been for valuable research tools such as the *CMS*, the product of hard work by two previous generations of scholars. M. Anastasiadou, O. Krzyszkowska and D. Panagiotopoulos, the present editors, agreed to include my monograph in the *CMS* Beihefte series, and facilitated my work in every way possible; I can only hope that the present volume lives up to the excellent level they are endeavouring to maintain for the *CMS* in the future.

My thanks go to the colleagues who allowed me to consult their work prior to publication, and shared enlightening discussions and arguments during the excavation and beyond: F. Georma; I. Nikolakopoulou; A. Vlachopoulos; P. Sofianou; D. Mylona; M. Tsoulakou; S. Vakirtzi; I. Tzachili; K. Birtacha; M. Marthari; D. Kriga; J. Hilditch for her generous expert opinion; J. Weingarten, L. Platon, N. Marinatos, D. Panagiotopoulos, C. Shelmerdine, C. Reali for allowing me to read some of their unpublished work and for stimulating and informative discussions.

The writing of this monograph would not have been possible without the Lise-Meitner senior post-doctoral position that allowed me to spend two years (2012–14) at the Institute of Classical Archaeology in the University of Vienna, under the discrete supervision of F. Blakolmer; indeed the sections regarding the remarkable iconography, which often defies easy interpretation, have been greatly enhanced thanks to Viennese influences and eye-opening discussions. I am additionally obliged to the consecutive directors of the Institute, M. Meyer and G. Schörner, for welcoming me in Vienna and making sure I had everything that was necessary for my research. The Austrian *Fonds zur Förderung der wissenschaftlichen Forschung* is to be thanked for the financial support during my stay in Vienna, as well as towards the publication of this book in particular (*FWF, Projekte M1427 und PUB303*).

I am and will remain indebted to I. Pini, O. Krzyszkowska, F. Blakolmer and C. Doumas, who proofread the manuscript initially, as well as J. Bennet and C. Macdonald, who took it up at a later (but not the latest) stage. The final version benefitted greatly from an exhaustive review once more by the editors. The corrections, suggestions and questions of these reviewers decidedly improved the quality of this monograph; omissions and mistakes, some of them against my reviewers' better judgement, remain stubbornly my own.

Seeing the end result, I have come to realize that none of the above would have been possible without M. Anastasiadou, whose hard work and unwavering dedication made her the natural conductor of the book's orchestra. I am also thankful to S. Lieberknecht, V. Ronchi and A. Theodoropoulou for the drawings of seal faces and impressions previously unpublished. To the research assistants involved in various stages of the publication process, D. Antypas, A. Scognamiglio, S. Tuppat and D. Wolf, some of whom I was never even able to meet, I extend not only my gratitude for their contribution, but also my wishes for a future that corresponds to their high level of commitment and punctuality. The last word belongs to N. Valasiadis for his contribution in setting up the book in its current form.

Last but not least, I would like to express my love and appreciation for my family (its living and deceased members), as well as my extended family of friends and colleagues for their moral support all these years, and for having faith in me in a firm and at times unfounded manner. You know who you are, and I would have achieved nothing without you.

Artemis Karnava
Berlin, 24/8/2018

GENERAL ABBREVIATIONS

E	East
EBA	Early Bronze Age
EC	Early Cycladic
EH	Early Helladic
HMs	Herakleion Museum sealings inventory no(s).
LBA	Late Bronze Age
LC	Late Cycladic
LM	Late Minoan
MC	Middle Cycladic
MM	Middle Minoan
MPTh	Museum of Prehistoric Thera
N	North
NE	North Extension (of a NPP)
NPP	New Pillar Pit (opened during 1999–2003 for the foundation of the new shelter)
PP	Pillar Pit (opened during 1969–74 for the foundation of the old Dexion shelter)
S	South
SDL	Seismic Destruction Level
VDL	Volcanic Destruction Level
W	West
WQ	Western Quarters (of Complex Alpha)

Linear A inscriptions are denoted according to their major publication (*GORILA* I–V), where the abbreviation for a findspot (THE: Thera) is followed by a designation of the kind of document (Zb: inscription incised on a clay vessel; Zc: inscription painted on a clay vessel), followed by its serial number (within the site/findspot). References to the *CMS* in the figures are abbreviated as follows:

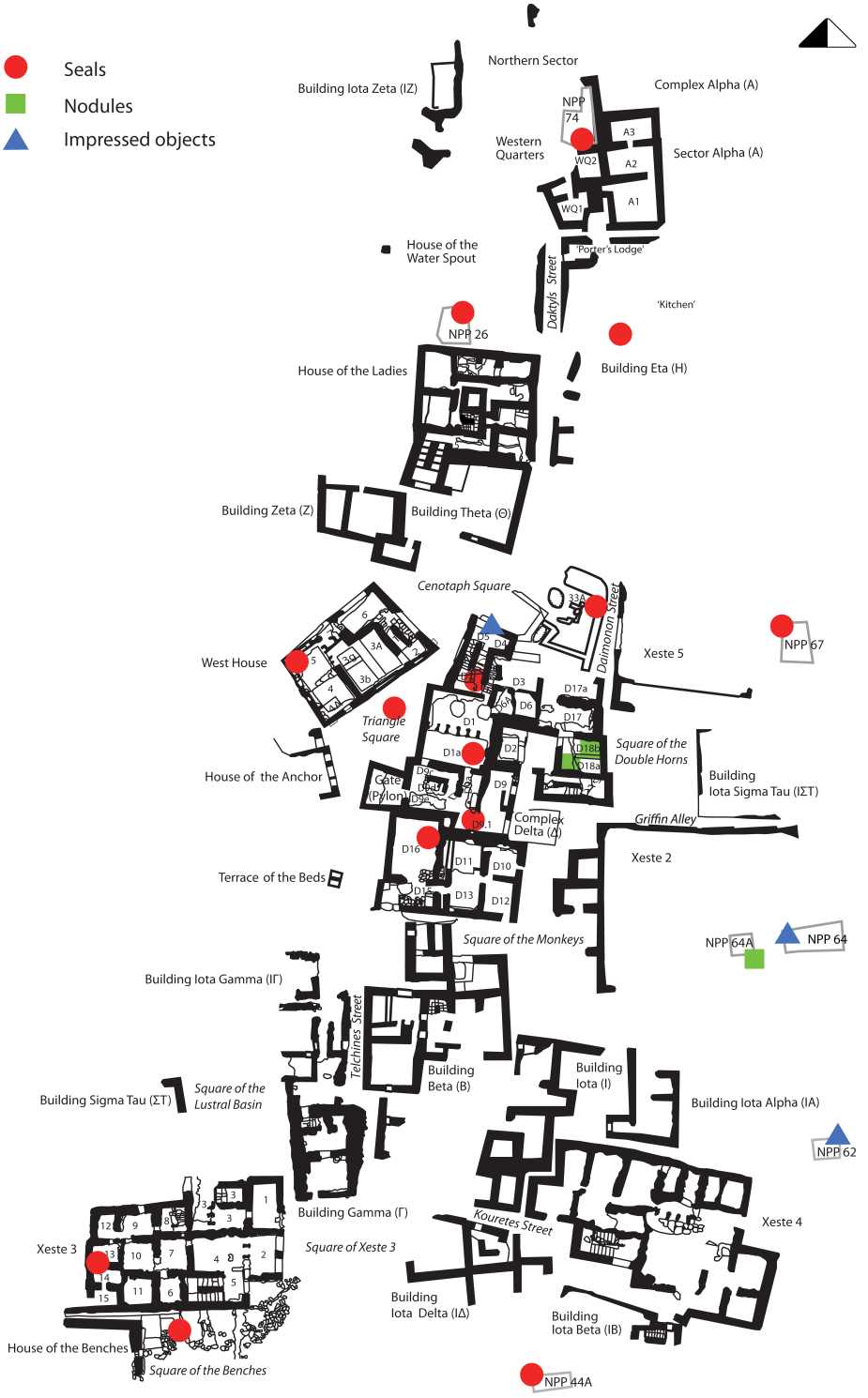
I	*CMS* I no(s).	VS3	*CMS* V Suppl. 3 no(s).
IS	*CMS* I Suppl. no(s).	VI	*CMS* VI no(s).
II,1–8	*CMS* II,1–8 no(s).	VII	*CMS* VII no(s).
III	*CMS* III no(s).	VIII	*CMS* VIII no(s).
IV	*CMS* IV no(s).	IX	*CMS* IX no(s).
V	*CMS* V no(s).	X	*CMS* X no(s).
VS1A	*CMS* V Suppl. 1A no(s).	XI	*CMS* XI no(s).
VS1B	*CMS* V Suppl. 1B no(s).	XII	*CMS* XII no(s).
VS2	*CMS* V Suppl. 2 no(s).	XIII	*CMS* XIII no(s).

CHRONOLOGICAL TABLE

Palaces	Crete	'Low'	'High'	Akrotiri
	MM IA	2100–1900	2075–1900	MC A
Old	MM IB	1900–1800	1900–1850	
	MM II	1800–1700	1850–1800	MC B
	MM IIB–IIIA		1800–1750	MC C–D
New	MM III	1700–1600	1750–1700	
	LM IA	1600–1500 Akrotiri: 1530	1700–1575 Akrotiri: 1623	LC I1–I2
	LM IB	1500–1450	1575–1500	

Based on: Treuil *et al.* 2008, 32–33, tables II–III; further corrections/refinements can be found in Warren 2010, 393, fig. 3. The Akrotiri MC and LC ceramic phases are from Knappett – Nikolakopoulou 2005, 176; 2008, 3, table 1, where the 'high' chronology is followed.

MAP OF FINDSPOTS, AKROTIRI



INTRODUCTION

The Bronze Age settlement of Akrotiri in the Aegean island of Thera has always been a prolific site in terms of the quantity and quality of archaeological finds.[1] The devastating volcanic eruption that caused its total destruction in the 17th/16th century BC is nonetheless also to be credited for the exceptional taphonomic conditions which resulted in the preservation of large bulks of material remains. The thick volcanic pumice layers that shrouded the entire island prevented what is the rule following settlement destructions: the plundering of surviving objects and their disappearance in the course of time.

The material remains of the Volcanic Destruction Level (henceforth VDL) at Akrotiri appear therefore to represent a freeze-frame: what has mostly attracted the interest of scholars and public alike is this latest phase in the life of the settlement.[2] After an initial phase in the archaeological investigations from 1967 onwards, when the layouts of buildings were first detected beneath and amidst thick layers of volcanic debris, research subsequently focused on the interior of buildings, in the streets and squares of the LC I town. However, not even this picture proved to be 'frozen': there is sufficient evidence to support the original theory of the then excavator, S. Marinatos, concerning the activities of the so-called squatters throughout the settlement after the very last earthquake that preceded the volcanic eruption.[3] It is believed today that the people once so-thought of as 'squatters' were in all likelihood the inhabitants of Akrotiri, who were mobilized in various ways in the aftermath of the strong earthquake and began repairing their damaged houses.[4] At this point of our investigations, it is not possible to calculate how much time elapsed, i. e. if it was a matter of hours, days or weeks, before the volcano caught up with them.[5]

New finds continue to come to light. The excavation has celebrated its 40th anniversary[6] and its 50th was celebrated in 2017. During its fourth decade extensive excavations were carried out for the installation of a new shelter over the site; they yielded finds of impressive quantity as well as quality, which were retrieved from the trenches dug for the placement of the shelter pillars.[7] Trenches for the installation of pillars had also been dug from 1969 onwards in order for a Dexion shelter to be erected.[8] The finds from these recent excava-

1 On the excavation campaigns see Mamet – Gorceix 1870; Gorceix – Mamet 1870; *Thera* I–VII; *Praktika* 1975–77; 1984–85; 1987; 1990; 1992–96; 1999–2001.

2 Most doctoral theses and monographs produced with material from the site deal with the LC I phase: Marthari 1993; Televantou 1994; Palyvou 1999; Michailidou 2001; Nikolakopoulou 2002; Kriga 2003a. The studies that concern earlier phases (EC, MC) are also filtered through the prism of the latest phase, since they examine mostly material that was retrieved in the LC I strata: Papagiannopoulou 1991; Sotirakopoulou 1999.

3 Not to be confused with the seismic activity that resulted in the Seismic Destruction Level (SDL), which occured during the early phase of LC I at Akrotiri (Marthari 1984; Palyvou 1984).

4 *Thera* III, 7; Nikolakopoulou 2003.

5 On the basis of ^{14}C evidence it has recently been suggested that it could have been years (Maniatis 2012).

6 Doumas forthcoming.

7 *Ergon* 1999; *Praktika* 1999; *Ergon* 2000; 2001. The pillar trenches were excavated under the same method as any regular excavation trench would be and are designated in this study as New Pillar Pits (NPP).

8 They are reported for the first time in *Thera* III, 24–33, where they are called 'wells'. They continue to be dug and reported as late as 1974, when they are all marked in *Thera* VII, plan B. In the present study the old shelter trenches are referred to as 'Pillar Pits' (PP).

tions from the pillar trenches, currently under study and publication, have managed to overshadow the previous results for a number of reasons. They have doubled the amount of pottery retrieved from the excavation; they have provided, for the first time, ample information for the earlier phases, namely the EC and the MC periods, thus allowing experts to elaborate and enhance their knowledge in terms of pottery sequences, architecture, town planning etc.[9] Nonetheless, the results of the older excavations are far from insignificant, not least because they remain essentially unpublished.[10] Although our knowledge of LC I Akrotiri is far more complete and clear than for any of its contemporaneous sites, every piece of evidence coming from the site continues to garner lively interest and attention.

The largest portion of material presented here, the sealings, belong to the category of exceptional finds that date to the latest pre-eruption period. One might even say that finds such as these were to be expected from prolific Akrotiri, but their discovery has had wider repercussions than previously imagined. A series of questions arose, since most are document sealings of Cretan provenance that were impressed in their majority by gold signet rings, including some that could be listed under the so-called Minoan replica rings.[11]

The initial aim of this monograph was to present these sealings. It seemed, however, additionally opportune to the director of the excavation, C. Doumas, to suggest to me the inclusion of seals and seal impressions retrieved on the site thus far, both published and unpublished. A large part of this book is accordingly dedicated to the contexts of the items in question. The contexts are examined in order to establish whether they are meaningful or not in our interpretation of the seals, the sealings and the items bearing seal impressions. However, on the basis of what we now know about the inhabitants' activity on the site until the very end, it has to be stressed that any study of the latest pre-eruption phase at Akrotiri is bound to be confronted with the question posed by Macdonald:[12] 'To what extent are the contexts in which objects are found in Akrotiri the context of their use, as opposed to their storage contexts, or as opposed to their "storage for protection against earthquake" contexts?'

The study was greatly facilitated by the arrangement of the material in a small Filemaker database, where all the available information, including photographs and drawings, was inserted. The database helped make the study more systematic and allowed for a clearer look into groupings and divisions within the sealings material.

Chapter 1 deals with seals **S1**–**S16** retrieved from Akrotiri to date and dating from the MC period to the final volcanic destruction phase. Almost all were found in the excavations at the site from 1967 onwards; only one seal, reportedly found in excavations carried out by French investigators in the 19th century is nowhere to be traced today.[13] None of the seals found so far on the site has produced any kind of impression, at least none that we have yet been able to trace. Sealings **N1**–**N74** found in Rooms D18a and D18b, as well as the unique

9 For the multi-faceted problems in the investigation of earlier phases, see Marthari 1990, 57–58.

10 The small volumes *Thera* I–VII, which are used extensively throughout the present study, are, as a matter of fact, reprints (translated in English) of the annual excavation reports Marinatos submitted to *Praktika* (the annual reports journal of the Archaeological Society at Athens that oversees the excavation of Akrotiri) each year from 1967 until his passing. A notable exception is Doumas 2007a.

11 For the term, see Chapter 4, pp. 186–94.

12 Macdonald, in response to Marinatos 1990, 377.

13 Mentioned in Fouqué 1879, 112; only a drawing of the seal has recently been recovered (Karnava 2014b, 48 no. 42b).

small sealing fragment **N75** retrieved from the area to the S of Xeste 2, constitute the subject of Chapter 2. The seals that impressed these sealings have not been found in Akrotiri or elsewhere.[14] Chapter 3 includes seal impressions **I1**–**I3** found on a few different objects.

Each of the above chapters starts with the presentation of contextual archaeological data. The seals were retrieved in 14 different findspots, the sealings in three and the stamped objects in another three: all in all, 20 different findspots within Akrotiri had to be discussed, none of which has a proper primary publication. The brief commentaries that conclude the presentation of each context convey this author's interpretation of the relevant context on the basis of the available data, and were drafted after extensive consultation of the excavation daybooks. After the contexts, each chapter continues with matters of typology and function, proceeds to iconography, and concludes with a discussion on the material presented; the discussion also summarizes some of the points made in the chapters.

Chapter 4 starts with a historical overview of sealing studies in the Aegean and then discusses certain aspects of Minoan Neopalatial administrative practices on the basis of the evidence extracted from the Akrotiri sealings, since they offer invaluable new insights on the matter. This rather unorthodox placement of reviewing the literature and previous studies was deemed necessary, because some basic concepts in our understanding of Minoan Neopalatial administrative practices were revised on account of the new Akrotiri evidence. It was therefore necessary for the Akrotiri data presentation to take precedence and then for the review to follow. The reader is of course at liberty to follow his/her own reading sequence.

The Concluding Remarks bring this monograph text to a close. My aim has been for the primary presentation of this material to be as complete and objective as possible, so that the reader can appreciate the evidence on his/her own. For this reason, interpretations are kept to a minimum and the final remarks, which touch on a variety of topics, are neither exhaustive nor definitive. Some overlap between the final discussions in Chapters 1–3, Chapter 4 and the discussions in this last section is necessary in order to secure the autonomy of each chapter as well as that of the Concluding Remarks. It is also true that, owing to the wealth of publications and information available nowadays, readers often resort to 'diagonal reading' or move directly to the conclusions of papers and books. In order to rescue the reader from missing out on important yet subliminal points scattered throughout the book, I have deliberately chosen to repeat them.

The book closes with a catalogue of the material under discussion. Each entry takes up a single page and contains textual and image data (photographs and drawings). The relatively small quantity of material under examination has permitted this exhaustive, holistic documentation with between four and ten illustrations for each entry. The specific way that the sealings in particular are presented, with photographs taken of their different sides, appears here for the first time in print and aims to provide the reader with a sense of what an actual sealing looked like. Sealings are rare archaeological finds and it is unlikely that even experienced field archaeologists or rugged Cretologists would ever have excavated or studied such finds.

14 As a matter of fact there is only one instance in the whole of the corpus of Aegean seals and seal impressions where a possible match between a seal and an ancient impression has been suggested: a seal said to be from Elis (*CMS* XI no. 27) and a sealing found in the Mycenaean palace of Pylos (Pini *et al.* 1997, 9 no. 15; *CMS* I Suppl. no. 180).

As a closing comment I would like to add that it is virtually impossible today to take into account all relevant bibliography and to also explore all possible research trends arising from the study of a specific set of archaeological material. I trust that I have taken into account the appropriate publications regarding Akrotiri, which has almost become a field on its own, the Cyclades, Minoan Crete, ancient administration and many other exotic or not-so-exotic topics, but I am certain that I have also missed much potentially interesting or relevant literature.

I hope that the archaeological community will proceed with the critical appreciation of the set of evidence presented here and that this monograph will provide a starting point for further discussion and research.

CHAPTER 1: THE SEALS

In modern parlance a 'seal' is sometimes taken to be an item bearing the impression of a device that authenticates the document or container to which it is attached.[15] In the present study, however, this is how a 'sealing' is defined, which in our case is made of clay.[16] Here the term 'seal' is used for the actual device which made an impression, or was capable of doing so. This qualification is needed since not all 'seals' *necessarily* served a sphragistic purpose, i. e. to impress sealings. Conceivably, some were used as ornaments or jewellery, although assigning these functions to 'seals' also requires some sort of demonstrable basis. Hence the terms 'gems' or 'gemstones', sometimes applied to ancient seals,[17] are eschewed entirely in the present study.

The objects examined under the rubric The Seals amount to 16 pieces. The definition under which they were included here is that of small objects with engraved motifs in intaglio.[18] Most but not all of them fulfil the criterion of a suspension hole; **S7** does not have a perforation, **S13** probably had one, but its upper part, where this would have been, is broken away.

The seals found during more than 40 years of excavations at Akrotiri are not numerous, at least not by Akrotiri standards (*Table 1*). They do, however, represent more than one period in the life of the settlement, starting with the earlier habitation phase as reflected in the recent finds of the underground rock-cut chambers.[19] Seal **S3** was found in one of these chambers and belonged to a layer that is dated to the MC A period, which roughly corresponds to the Cretan MM I period.[20] Two seals represent Cretan Protopalatial seal production, and although **S5** was found in the latest pre-eruption levels, **S15** seems to have been discarded at the end of the MM III period. Most seals, however, namely **S1**, **S2**, **S4**, **S6**, **S9**, **S11**, **S12**, **S14** and **S16**, can be paralleled without any hesitation by Cretan Neopalatial products, and it is in chronologically appropriate horizons that they were found. Only **S4** comes from an earlier phase stratigraphically, both with regard to Akrotiri as well as the Cretan Neopalatial period, and allows us to identify it as a product of the Cretan MM III period. Finally, **S7**, **S8**, **S10** and **S13**, all found in the latest pre-eruption levels, can be seen as local products. Since no parallels for these can be found, we are entirely reliant on their context dating, and thus have no idea as to whether they were much older or roughly contemporary with their findspots.

A general observation is, therefore, that the overwhelming majority of seals found at Akrotiri can be regarded with certainty to have been imported from Crete. Imported objects are far from unusual in the MC and especially the LC periods at Akrotiri, and the same applies to local imitations. Local seal production does not, however, point to any

15 Collon 1987, 5, note.

16 The words 'nodule' and 'sealing' are used indiscriminately in the present study, because Minoan sealings were small lumps (i. e. nodules) of clay.

17 Boardman 1997, 74.

18 Krzyszkowska (2005a, 2) defines a seal as an object which produces a motif in relief when its engraved surface is pressed against a soft, malleable material.

19 Doumas 2008; Sotirakopoulou 2008.

20 *Praktika* 1993, 17; Nikolakopoulou *et al.* 2008, 313–17.

	Excavation Cat. No.	Publication	Findspot	Motif (as seen on the seal)	Shape/Material	Dimensions (in cm)
S1	L3136	V Suppl. 3 no. 389	Complex Alpha (A), Western Quarters Room 3 (NPP 74)	'talismanic' speared goat standing in right profile and undefinable linear motifs	lentoid: jasper, red-orange	Ø 1.33–1.41 Th. 0.74
S2	A9022	V Suppl. 3 no. 388	Complex Alpha (A), Western Quarters Room 3 (NPP 74)	pair of 'talismanic' (?) fish, *tête-bêche*	lentoid: soft stone, orange-brown	Ø 1.29–1.38 Th. 0.55
S3	L3139	V Suppl. 3 no. 386	NPP 26NE	cross-hatching	pendant vertical plate: steatite, black	L. 1.43–1.54 W. 0.77–1.09 H. 2.73–2.95
S4	L3134	V Suppl. 3 no. 390	NPP 67	'talismanic' (?) fish, borings, circle, centred-circles ornament, lines	amygdaloid: smoky quartz, semi-transparent	L. 2.1 W. 1.46 Th. 0.75
S5	A4212	V Suppl. 1B no. 363; Tzachili 2007a, 281–82, no. 2	West House, Room 5	centred-circles ornament, hatching + cross-hatching	discoid, two-sided: steatite, brownish yellow	Ø 1.3–1.4 Th. 0.65
S6	A3009	Televantou 1984, 16–17; Tzachili 2007a, 274 no. 1	Triangle Square	quadruped in left profile	lentoid: jasper (?), reddish-brown	Ø 1.47–1.54 Th. 0.32–0.42
S7	A3305	V Suppl. 1B no. 362; Tzachili 2007a, 281–82, no. 1	Triangle Square	unintelligible design comprising wavy and straight lines and a dot	disc (no suspension hole): tuff whitish-green	Ø 1.95 Th. 0.45
S8	L1836	unpublished	Cenotaph Square, area of PP 17	two oblique parallel lines	pendant vertical plate, concave-convex: tuff (?), whitish with a green hue	L. 1.65 W. 0.5 H. 1.6

Table 1. The seals found at Akrotiri.

	Excavation Cat. No.	Publication	Findspot	Motif (as seen on the seal)	Shape/Material	Dimensions (in cm)
S9	A0920	V Suppl. 1B no. 365	Delta-North, Room 4–5, staircase	centred-circles ornament and lines	disc-shaped lentoid: serpentine, dark green-black	Ø 1.35 Th. 0.45
S10	L1835	Papadimitriou-Grammenou 2008, 146, fig. 15	Delta-West, Room D1a	borings and lines	pendant vertical plate: volcanic stone, black	L. 2.3–2.45, W. 0.65–1.15 H. 2.7
S11	A3752	V Suppl. 1B no. 364	Delta-West, Room D9.1	'talismanic' spray motif with centred-circles	lentoid: serpentine, dark green-grey	Ø 1.65–1.75 Th. 0.65
S12	A2838	V no. 690	Delta-South, Room D16	sphinx in right profile and dolphin under its belly	lentoid: jasper, brown-red	Ø 1.4 Th. 0.55
S13	A3588	V Suppl. 1B no. 361	Square of the Benches	a line divides the face longitudinally and from either side of it emanate three short lines	stamp seal: clay, yellowish	L. 3.6 W. 2.7 H. pres. 4.5
S14	A6383	*Ergon* 1990, 113; *Praktika* 1990, 234, pl. 146a	Xeste 3, Rooms 13–14	human (male) figure (?) walking in left profile, line	two-sided (?) disc: steatite, black	Ø 1.56–1.73 Th. 0.26–0.39
S15	A8385	V Suppl. 3 no. 387	Building Iota Beta (IB), NPP 44A	'star of David'	*Petschaft*: calcareous material, whitish	Ø 1.25 H. 1.15
S16	–	Fouqué 1879, 112	unexcavated building to the E of the House of the Ladies	'talismanic' and/or 'tectonic' ornament with a centred-circle	lentoid, discoid or disc: 'serpentine'	Ø estim. 1.3

Table 1. The seals found at Akrotiri (continued).

discernible emulation of Cretan trends and techniques and stands apart from Minoan seal production; consequently, as will be shown further below, these presumed local products are difficult to categorize and appreciate.[21]

THE CONTEXTS: SIXTEEN SEALS, FOURTEEN FINDSPOTS

In the following pages the evidence regarding the circumstances in which the Akrotiri seals were retrieved is set out in an effort to discern patterns of deposition. The investigation starts arbitrarily from the N part of the settlement and proceeds to the S,[22] regardless of the chronological correlations of the items in question; these are discussed at the end. The reader will notice an uneven amount of information concerning more recent as opposed to older excavation data: changes in excavation techniques, mentality and goals, and, consequently, recording methods, are only commendable in an excavation that has been on-going for more than 40 years. The length of commentary following the description of each seal context is equally uneven. Certain contexts, such as Rooms D9.1 and D16, have been extensively discussed in the past, and hence more literature had to be assimilated. Other contexts have never been presented to the public before, so their presentation is limited to the reporting and evaluating of excavation data.

Since a number of the contexts from which seals and impressed items were retrieved are unpublished or pending publication, the suggested use(s) for the seals will require substantiation in the future, based on thorough presentation of the contexts in question. Again, and at the risk of being repetitive, it needs to be stressed that the picture provided by the latest pre-eruption phase at Akrotiri can be deceptive in that the last earthquake and the need for building repairs caused much moving of house equipment either between rooms of the same building or even towards the exterior of buildings. Thus, secondary contexts can be mistaken for primary ones, so the characterization of any context as *in situ* has to be demonstrated. In such cases, only the final publication will give definitive answers. On the other hand, seals found in layers older than the latest pre-eruption phase usually come from contexts for which we have partial knowledge, since an earlier context was rarely investigated in what could be its totality.

Seals S1, S2: Complex Alpha (A), Western Quarters, Room 3 (NPP 74)

Sector Alpha (A) was one of the first buildings uncovered at the site of Akrotiri,[23] and is situated in the northern section of the overall excavated area. To the W of Alpha the excavator Marinatos detected and partly investigated what appeared to be a separate, yet contiguous sector, the Western Quarters.[24] He immediately noticed the presence of a double wall separating and, at the same time, joining the two building units. In light of the evidence

21 Karnava 2016a.

22 The possible context of seal **S16** is considered after all other contexts are discussed; it is the only seal for which only an approximate findspot is known.

23 *Thera* I, 16–34; II, 15–30; III, 8–11; Michailidou 2001, 268–81. It was initially also known as the 'Pithoi Storeroom'.

24 *Thera* II, 30–31; III, 11–15.

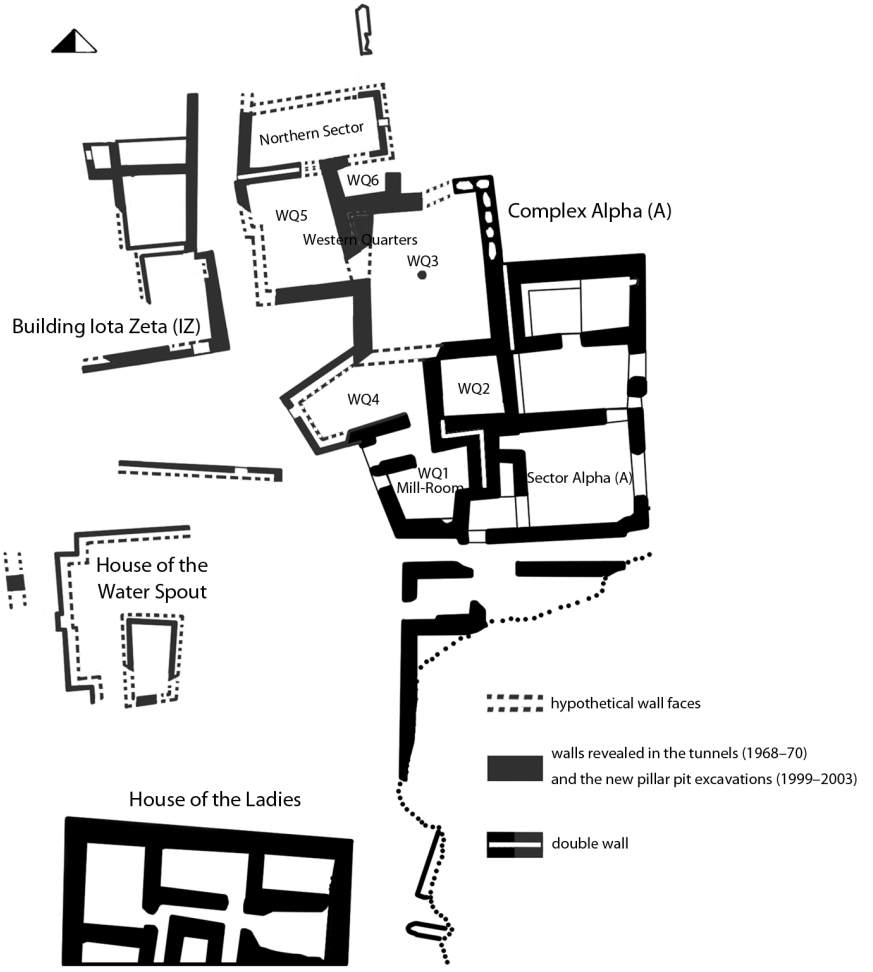


Fig. 1. The NW neighbourhood of the archaeological site, where WQ3 is situated (adapted from A. Karnava, in Doumas 2007c, 37, fig. e).

unearthed during the excavations for the new shelter, Sector Alpha (A) can be safely designated as 'Complex Alpha (A)' (much like Complex Delta [Δ], which is composed of four distinct building units),[25] since besides the 'Pithoi Storeroom' and the Western Quarters, a third building unit has been detected and partly excavated further to the N (dubbed the 'Northern Sector', *Fig. 1*).[26]

Since the initial investigations, it has become evident that the Western Quarters, as described by Marinatos, was a two-storey building unit.[27] The so-called Mill-Room (Room

25 See further below, Complex Delta (Δ), pp. 25–38.

26 Moschou – Karnava forthcoming.

27 Research has shown that extensive destructions, probably caused by a strong earthquake, resulted in masses of stones and debris falling onto the streets of the settlement, turning ground floors to basements and semi-basements (Marthari 1984; this assumption is further corroborated by the NPP trenches all over the settlement, see primarily *Praktika* 1999). A storey considered as 'ground floor' refers, therefore,

Fig. 2. Plan of NPP 74, opened in the interior of WQ3, with the exact locations of seals **S1** and **S2** found on the ground floor (Akrotiri Excavations Archives, after drawing by M. Hamawi).

1) and its antechamber, which served as the entrance to the unit, were rooms on the ground level, whereas Room 2 and Room 3 were first-floor rooms. Room 2 was also partly explored in its ground level, and the same happened with Room 3 during the opening of a PP for the old shelter in 1969. What is of interest here is Room 3, where NPP 74 was dug to the bedrock for a pillar for the new shelter (*Fig. 2*).[28] It was during the investigation of this pit in 2001 that seals **S1** and **S2** were found.

Based on combined observations from old and new excavations, on the first floor Room 3 appears to be a large room of c. 40 m², with a central column and a *polyparathyron* (pier-and-window partition) in parts (?) of its E and N walls.[29] On the ground level, it is impossible to speak of room dimensions, since not all the walls of the room were detected. A

to the building as an independent structure and not to the building embedded in the post-seismic reality of the settlement.

28 *Praktika* 1999, 156, fig. 1, where the position of NPP 74 is indicated on the plan of the site.

29 Palyvou 1999, 386–87, pl. 210d; 2005, 90, 144–45.

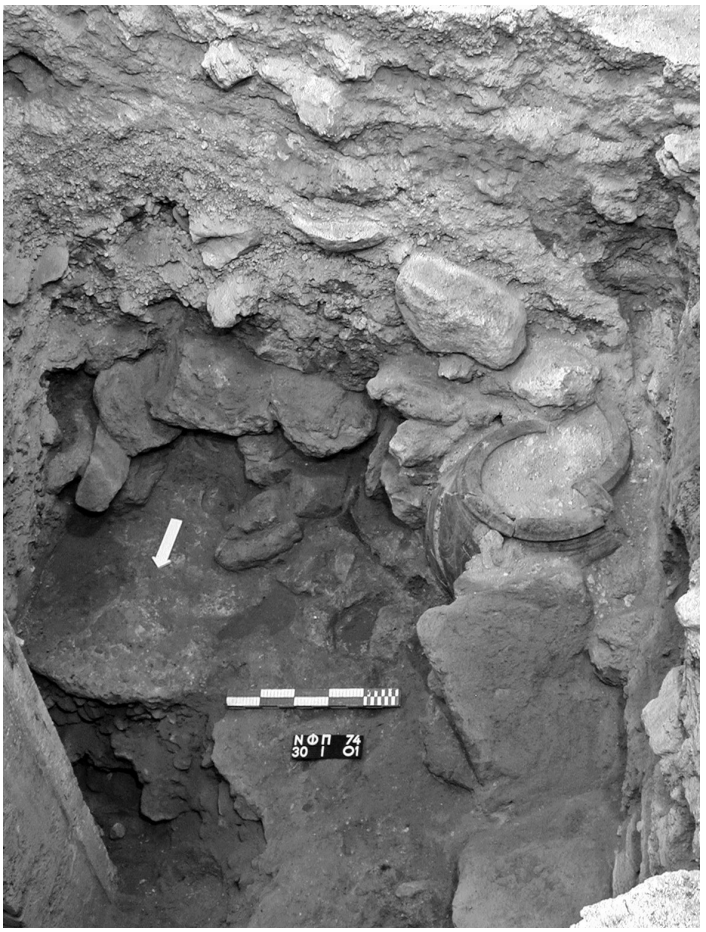


Fig. 3. Ground storey of WQ3 during excavation, with a pithos at the SW corner of the room; the arrow pointing to the N is placed on top of the area where seal **S1** was found (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

quadrangular stone was found in a spot directly corresponding to the circular column base on the upper floor;[30] the quadrangular stone could have served as a column base, if it turns out to be in the centre of the room when investigation in this particular room resumes. It is noteworthy that in the circulation pattern of the ground floor, Room 3 is situated relatively far from the unit entrance.

The excavation of the NPP revealed parts of the floors of both levels; the first-storey floor was preserved in excellent condition in the central, SW and S part of the room, but in places it had collapsed. The volcanic material had infiltrated towards the ground level through the collapsed part and filled the room, offering at the same time support to the rest of the first-storey floor. Contents of the first-floor room were found at the ground level, in a layer distinct from what were apparently the original contents of the ground level. The contents of the ground level comprised a pithos (*Fig. 3*), together with thirty-eight other

30 Moschou – Karnava forthcoming, fig. 19.

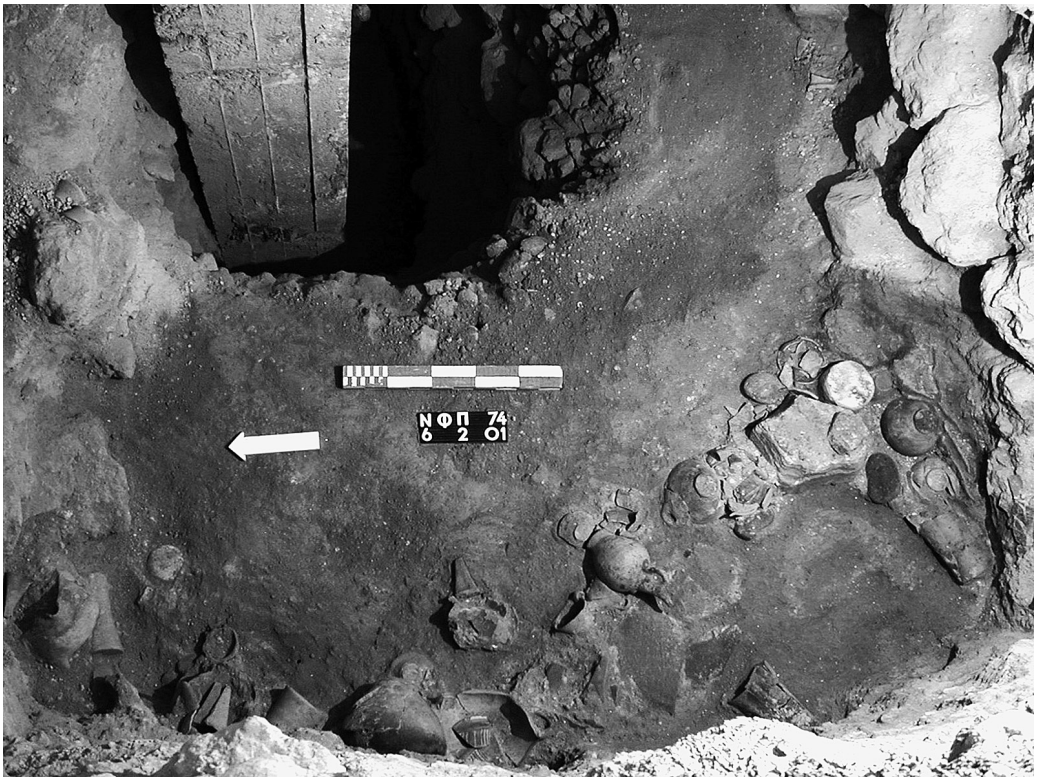


Fig. 4. Ground storey of WQ3 during excavation; the content of the room *in situ* (the pithos is already extracted from the SW corner) (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

whole clay vessels,[31] including a small lamp (*Fig. 4*). It is interesting to note that out of 32 pots that were extracted (six were left on the spot), eight were pierced on the bottom, and four of the eight were cylindrical rhyta; 14 pots were found turned upside-down on the floor. Besides the pots, the seals and the lamp, this part of the ground-level room yielded a cylindrical and a discoid object of white marble.[32] Finally, four unfired clay slabs were found in the same floor deposit, to the N of the pithos, together with a circular pithos lid of schist. These slabs had obviously fallen from a certain height because they had smashed a number of pots under them.

The red-orange jasper lentoid **S1** was found in a layer of 0.5 cm thickness, muddy and off-white in colour, which lay directly above the ground-level floor to the E of the pithos. The layer was sealed by a mix of soil and stones apparently belonging to the destruction layer of the ground level, thus ensuring that the seal was part of the ground-level's contents. The seal was not detected during the excavation, but was instead found during flotation of a soil sample. However, this sample was retrieved from a quite limited space, measuring

31 A pithoid jar was found next to the pithos, an *ethmopyxis* (strainer), an eyed jug, and 35 other vessels of small size: cups, cylindrical rhyta etc.

32 These objects are listed as 'marble' in the daybook and this identification is further corroborated by microscopic examination by A. Devetzi and V. Perdikatsis, to whom I am grateful for the information.

1.85 × 0.8 m, in close proximity to the pithos. No other finds were specifically reported from this very thin layer.

The other seal, the orange-brown soft stone lentoid **S2**, was found inside the pithos. The pithos was otherwise empty and filled with volcanic material, suggesting that when the upper floor partially collapsed it had in fact been empty. The layer covering the bottom of the pithos is described in the daybook in more or less the same terms as the layer in which seal **S1** was found, i. e. as muddy and off-white in colour.

The exact findspots of the two seals point to secondary deposition(s), since there is no reason to suggest that a seal's original place would be either the floor of a room or the bottom of a pithos (unless the seals were discarded, which does not appear to be the case here). It is possible that both seals were kept in the same location at the time of the destruction, a view supported by the comparable description of the layers in which they were found. The fact that one ended up inside the empty pithos and the other on the floor could suggest that they had fallen from somewhere higher up in the room (conceivably a shelf, a niche, or were they hanging on the wall [?]). We may safely exclude the possibility that the seals originated from the first floor, since it is highly improbable that both infiltrated the volcanic debris and landed at more or less the same depth.

Commentary: The picture given by the architectural as well as the movable finds of the ground floor Room 3 of the Western Quarters is that all are *in situ*, in the sense that we are in fact looking at the original contents of the ground-level room, although not necessarily in their original positions. It seems that this section of the building unit withstood the earthquake: roof fragments, although found crumbled into the first-floor room, preserved on their upper surface the so-called crust, a thin layer of fine yellowish pumice, characteristic of the first phase of deposition of volcanic materials.[33] This means that the roof was still in place at the time of the eruption, as was this part of the building unit underneath it. The founding of the building can be placed early in the LC I period.

The find circumstances of these seals are important in that neither the first- nor the ground-floor Room 3 present us with the masses of pottery that are almost the norm for Akrotiri rooms.[34] This, at least, excludes the possibility that the contents of each storey were transported or stacked from elsewhere. In addition, since the building unit seems to have survived the pre-eruption seismic destruction, inhabitants evidently did not bother with repairs or alterations. Regarding the original function of these rooms, we may safely preclude the storage of pottery or subsistence goods. Whether the room was a living quarter, if there ever existed a separate space reserved for sleeping at the time, a household activity area or a storage area for other perishable goods remains to be seen in future investigations. Elements that could be of importance are the noteworthy number of rhyta and the presence of the marble cylindrical objects, whatever their interpretation might be. Finally, one should keep in mind the position of the room itself within the ground level, namely its distance from the entrance of the unit.

33 Doumas 1990, 49.
34 Doumas 1983, 31.

Seal S3: Area to the N of the House of the Ladies (NPP 26NE)

In 2000–01 a NPP was opened to the N–NW of the House of the Ladies in an area previously not investigated.[35] After removing c. 4 m of volcanic depositions, a debris layer consisting of soil and stones of various sizes was uncovered. This layer of 1.4–1.6 m thickness continued down to the bedrock; it also covered the remains of two rooms built above ground (W and E), defined by three (or four [?]) walls founded directly onto the bedrock. The W room had a three-step stone staircase leading from its S (a narrow corridor between this space and the House of the Ladies) down to its interior. The debris layer covering these rooms contained pottery of the LC I–mature phase; therefore one is basically dealing with a building which went out of use in the latest pre-eruption period. The area investigated is located between the House of the Ladies and the House of the Water Spout, both standing and functional in the latest pre-eruption phase. The founding of the whole structure, however, essentially postdated the founding of the House of the Ladies, since the narrow space between them was found paved and at a level higher than the foundations of the House of the Ladies. In the NW of the excavated pit area an opening in the bedrock led to a double underground rock-cut chamber (*Fig. 5*).[36] The chamber was back-filled with EC–MC material. Thus, we may rule out the possibility that the rooms and the staircase were intended to facilitate access to the chambers, since these were already backfilled when the over-ground structure was built.

The black steatite pendant seal **S3** was found in the fill of the chamber in 2001. The E section of the chamber was divided into two spaces by a natural rock partition with E–W direction, which was left intact by those who had originally constructed or dug out the chamber. In the W section of the chamber, the only one investigated for reasons of safety, there were two crossing dry-stone walls; one of them, Wall Delta, had a N–S direction and constituted the W limit of the chamber (*Fig. 6*). The E face of Wall Delta appears uniform to a height of 0.55 m, and had dressed and well-fitted stones presenting an even face, but from its lower extremity downwards, the wall face appears irregular and even has a slightly different direction named Wall Delta/a. This irregular part was either a foundation or a different wall belonging to an earlier phase. The *locus* in which the seal was found began 0.23 m under the upper extremity of Wall Delta/a and had a thickness of 0.22 m: it was part of a layer covering this foundation/earlier wall. The seal was very near to the chamber's rock bottom at +21.50/+21 m; the *locus* also contained a considerable amount of pottery, animal bones, seashells, carbon, obsidian fragments, round stone balls, stone tools, and thus appears to have been debris from a habitation environment. The layer is dated by its pottery to the MC period, a ceramic phase corresponding to the Cretan MM I period; its diagnostic material dates it mainly to MM IA (*Fig. 7*).[37]

Commentary: The function of these underground chambers is a matter of debate. It has been suggested that they were originally burial chambers, and were subsequently back-

35 *Praktika* 1999, 156, fig. 1, where the position of NPP 26 is indicated on the plan of the site; Moschou – Karnava forthcoming. I thank I. Nikolakopoulou for clarifications regarding the stratigraphy and dating of the layers in NPP 26.

36 Sotirakopoulou 2008, 121, fig. 14.1, where NPP 26 is noted in a plan of the site showing the rock-cut chambers detected so far at Akrotiri.

37 Nikolakopoulou *et al.* 2008, 313–17.

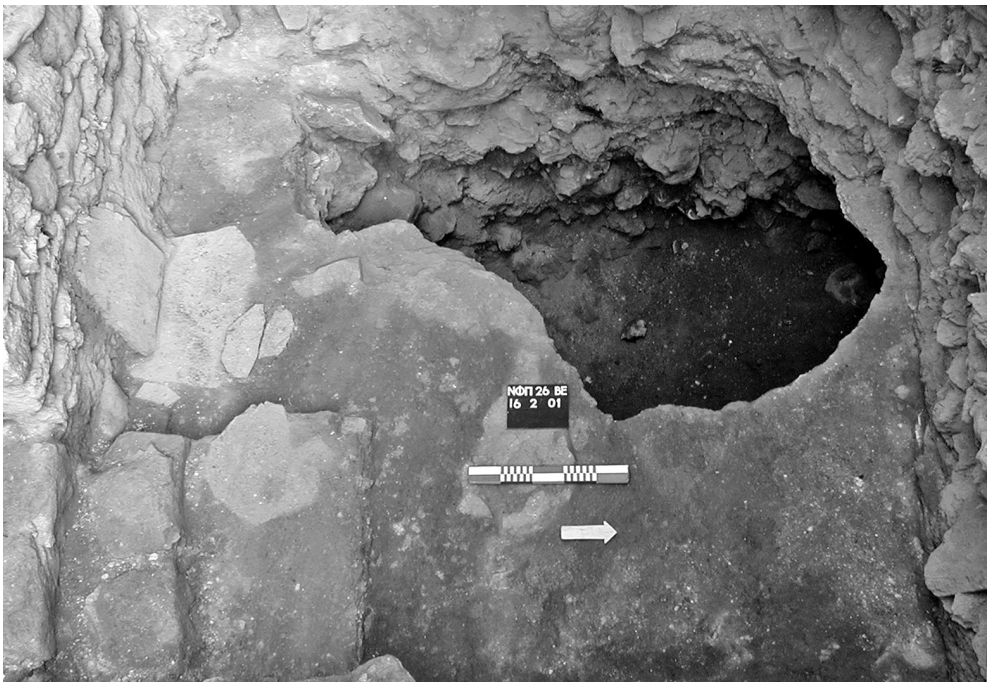


Fig. 5. NPP 26NE: opening in the bedrock leading to an underground chamber (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

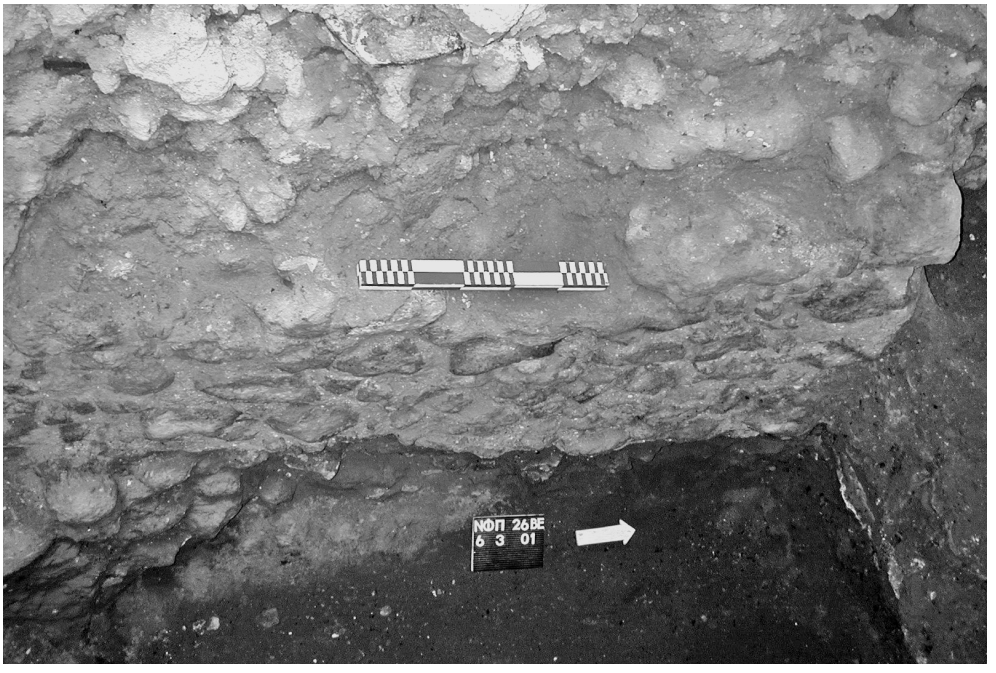


Fig. 6. NPP 26NE: Wall Delta inside the underground chamber; at its S extremity a foundation or remains of an earlier wall (Wall Delta/a) are visible (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

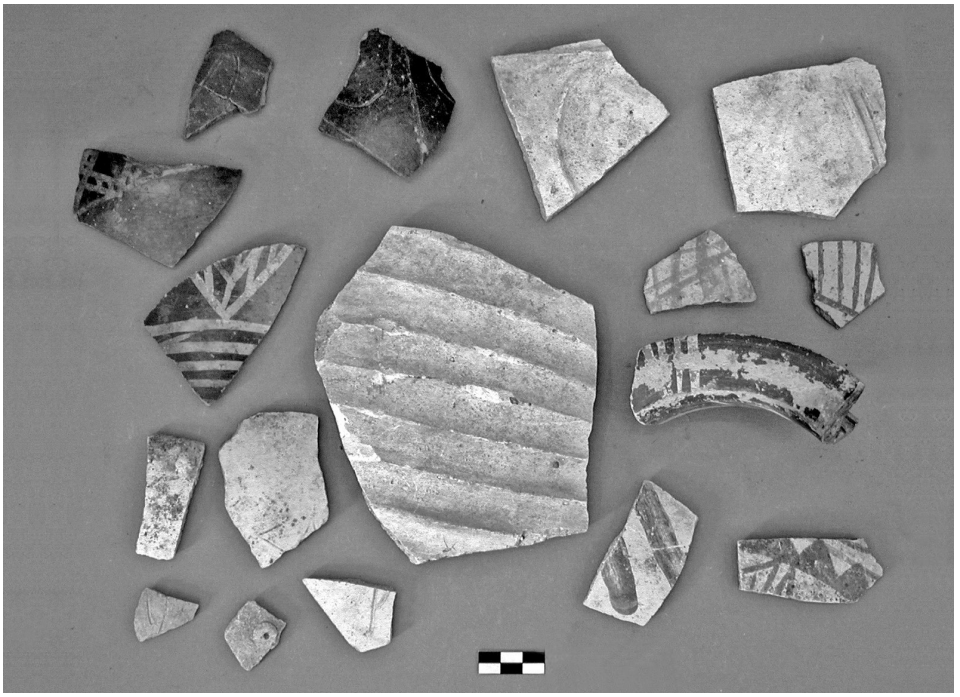


Fig. 7. NPP 26NE: diagnostic pottery from *locus* 26N024/NE, in which seal **S3** was found (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

Fig. 8. NPP 67: the floor of the MC room; the marked area is the part of the floor to be removed for the installation of the metal column for the new shelter (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

filled with habitation debris from a settlement overlying them or being very close.[38] A different interpretation views them as habitation sites all along, which were back-filled when they fell out of use.[39] The two interpretations agree in that they both regard the contents of chambers as settlement debris, a fact that is of importance as to the whereabouts of seal **S3** when first made and used. In this particular context it is evident that **S3**, along with the items found in the same layer, was a discard of a once-thriving settlement. The dating of the layer makes **S3** the earliest seal found at Akrotiri so far.

Seal S4: Area to the E of Xeste 5 (NPP 67)

NPP 67 is one of the most intriguing pits dug for the new shelter during the recent excavations, investigated in 2000–01.[40] It is impressive in that it produced a whole MC room, not damaged in any way or backfilled: it appears simply to have been put out of use after having been abandoned and sealed, and was then built over in the LC I period. This room produced some 200 whole vessels of the same period, which were found on top of the latest floor; it has not only given us some of the finest specimens of MC pottery, among which is also a jug with human figures in a libation scene,[41] but also seal **S4** which approaches the so-called talismanic tradition.

NPP 67 was opened to the E of Xeste 5 and two rooms belonging to the upper floor of a previously undiscovered LC building were initially revealed. Under one of these rooms another intact room came to light and was investigated in its entirety. The room measures 2.1 × 2.24 m, i.e. 4.7 m², and was preserved to the impressive height of 4 m, without any indication of an intermediate floor (*Fig. 8*). It contained the impressive number of pots previously mentioned; the fact that it was structurally sound and its movable contents were apparently intact at the time when it was sealed, leaves a question as to why it was sealed and built over.

The amygdaloid of smoky quartz **S4** was found in the substratum of the room's floor.[42] At first, only a part of the floor was excavated to allow the positioning of a circular metallic column for the new shelter (*Fig. 9*), and it was in this circular area that the seal was retrieved. Eventually, it was decided that the whole floor would be removed, to enable the investigation of an underground rock-cut chamber discovered below; the result is that we have a complete picture of the layer in which the seal was found. Evidently, the substratum bears no functional relation to the room and its contents, but contains relics of an even earlier situation, although within the same ceramic phase. A further underlying layer, which seemed to be an earlier floor, is important for the foundation and the dating of the construction of the room and, consequently, of the floor and its substratum. In this latter

38 Doumas 2008.

39 Sotirakopoulou 2008, esp. 131–34.

40 *Praktika* 1999, 156, fig. 1, where the position of NPP 67 is indicated on the plan of the site; 2000, pl. 120b, c; 2001, pl. 77b; *Ergon* 2000, 91, figs. 104, 105; 2001, 73, fig. 74; Knappett – Nikolakopoulou 2008; Tsoulakou forthcoming.

41 *Praktika* 2000, pl. 120b, c; Papagiannopoulou 2008, 441–44.

42 Tsoulakou forthcoming, where all the information concerning the context of the seal and the stratification of the pit comes from.

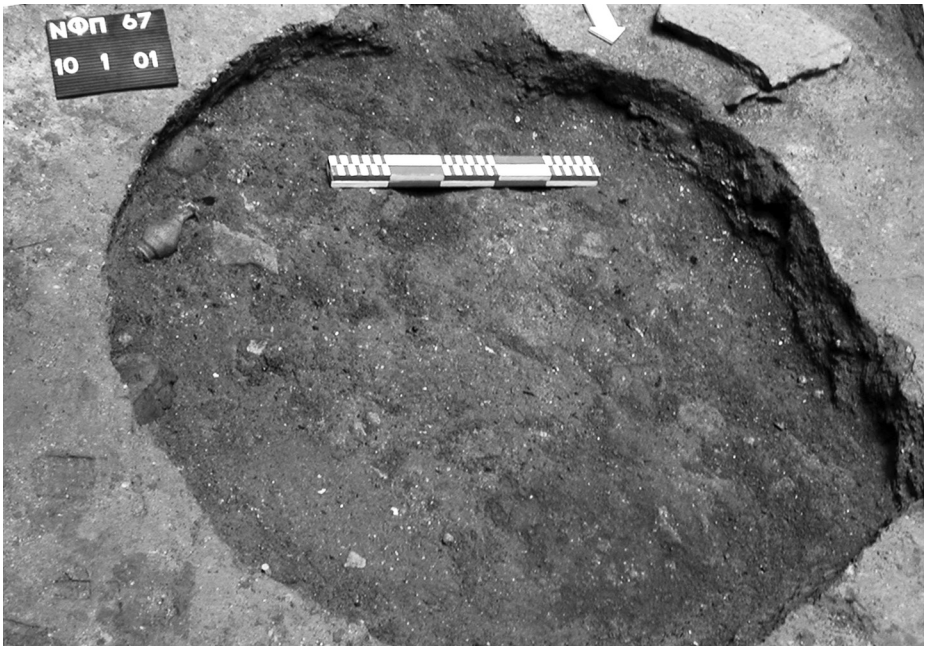


Fig. 9. NPP 67: the floor area, where seal **S4** was found, during excavation (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

floor, two cups placed upside-down point to a dedicatory rite.[43] The previously mentioned layers are all dated, by their pottery, within the same MC C period, which corresponds to MM IIIA in central Cretan terms.[44]

The substratum of the latest floor where the seal was found, a mere 0.08 m in thickness, contained in all 14 locally produced pots and four pots imported from Crete. The local examples comprise handleless conical, panelled and hemispherical cups, bowls, miniature vases, lamps, matt-painted and bichrome jugs; particular mention should be made of a pot sherd from an apparently earlier ceramic phase, MC A, where a human figure along with a probable ship's part appear. Apart from pottery, a number of other items was retrieved: a stone bead, a locally-produced tuff figurine of violin shape, loomweights, a stone ball, a copper loop, a faience fragment with painted decoration, a spindle whorl and a tuff object with suspension hole. In addition, the layer contained carbonized material, many animal bones and seashells, as well as obsidian fragments.

The exquisite hard stone amygdaloid **S4** is important because it comes not only from a stratified level, but also from a context that has been thoroughly excavated, a rarity for earlier strata. It dates from a time when imports, especially in terms of pottery vessels, are already a familiar trait at Akrotiri; the items imported are fine ware and curios, thought to have reached the island through an affiliation network.[45] The presence of this seal, which

43 A distinction should be made between pots commonly found under floors and those securely associated with architectural foundations, see MacGillivray *et al.* 1999. For a review of foundation deposits at Akrotiri, see Lanaras forthcoming.

44 Knappett – Nikolakopoulou 2008, 18, 34.

45 Knappett – Nikolakopoulou 2005, 181–83; 2008, 35–37.

fits very well within the time limit set for MC C, coincides with a marked increase in Minoan imports on the island, such as drinking, pouring and storage vessels (the first two obviously imported on their own merit). It is noteworthy that imports involve not only objects *per se*, but also the transfer of knowledge/technology, such as the wheel technique, which is first used, somewhat timidly, during this period.[46]

Commentary: The variety of finds along with the seal suggests that the use of this room in a period prior to the phase which gave us the abundant number of pots must have been very interesting as well. The presence of animal bones, seashells and obsidian, on the one hand, leads us to think of a habitation environment. On the other hand, the combination of items such as a seal made of a rare hard stone, a stone bead, a figurine, and the fragment of a faience object — all point to a rather luxurious environment. At this point and because the case of NPP 67 has no parallels anywhere in the settlement, there is no way to judge whether the MC room and/or its earlier phases are a particular or a common context during the MC period.

Seal S5: West House, Room 5

The West House is one of the few buildings at Akrotiri to have been thoroughly investigated, excavated on and off from 1970 to 1990.[47] It is another two-storey and, partly, even three-storey building, founded in what appears to be a 'mature' MC phase, as evidenced by trial trenches conducted under the floors of certain rooms.[48] The building was functional until the end, although it underwent the same hardships as the other LC I buildings during the time of the SDL, with exterior levels rising due to the discard of seismic debris and ground-level rooms becoming semi-underground rooms.[49] The West House is considered to be a 'private' house, with rooms dedicated to craft activities such as weaving in Room 3 of the first floor, storage in Rooms 3c, 4, 5, 6 of the ground floor, and food preparation in Room 3a of the ground floor. Although missing a 'kitchen' installation, the first floor also famously possesses one of the most ancient lavatories ever attested in Room 4, a structure that underscores the high level of technical and engineering expertise possessed by the inhabitants of Akrotiri.

Both storeys of Room 5 were first excavated in 1972.[50] Attention naturally concentrated on the first-storey wall paintings, which included the Miniature Fresco.[51] The first-storey floor, covered with slab stones, was found collapsed almost in its entirety inside the ground-level room; under the fallen slabs, the ground level contained pots of various sizes

46 Knappett – Nikolakopoulou 2005, 177–79.

47 Preliminary reports appeared in the respective *Ergon* and *Praktika* but also in Doumas 1983, 48–49; Michailidou 2001, 41–174; Palyvou 2005, 46–53; Doumas 2007a; 2007b.

48 *Praktika* 1984, 340–43, pl. 182.

49 Marinatos called the ground level 'the basement'; he was aware that the lower level floor was at a height lower than outdoors. This is again due to the fact that the height of open spaces rose because of debris cleared out following a destruction, which postdates the building of the West House (Marthari 1984, 119, 126, fig. 1; Palyvou 1984, 134–35, fig. 5).

50 *Thera* VI, 22–24, pls. 38–43.

51 For the Miniature Fresco, see Televantou 1994.

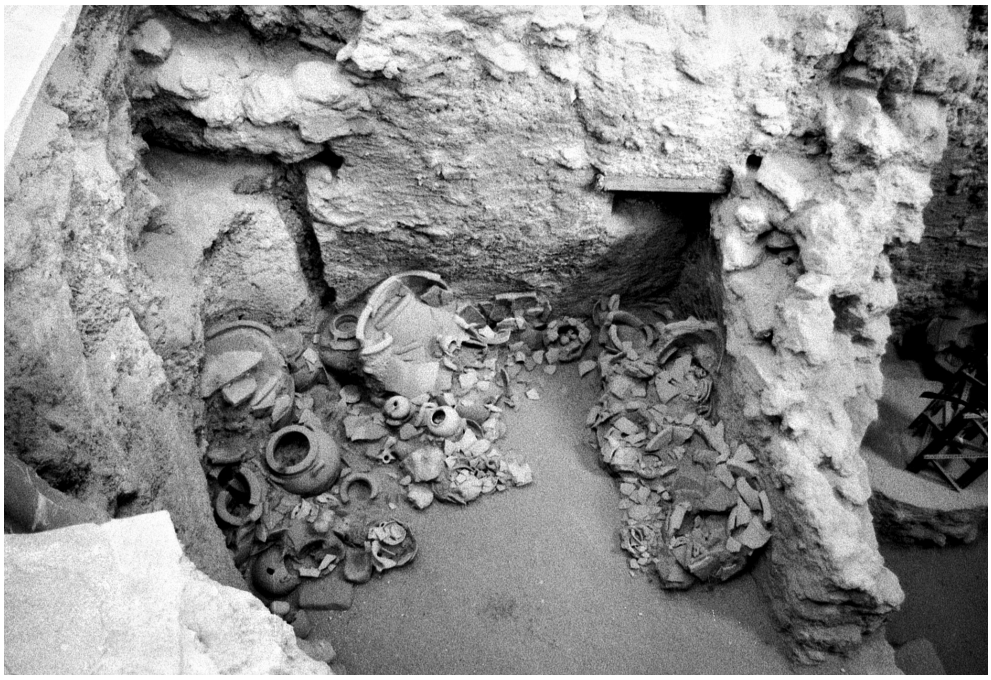


Fig. 10. West House, ground floor: Room 5 with its contents *in situ* (Akrotiri Excavations Archives; *Thera* VI, pl. 43b, where the room is shown at the end of the 1972 season; Doumas 2007b, 35, fig. 12).

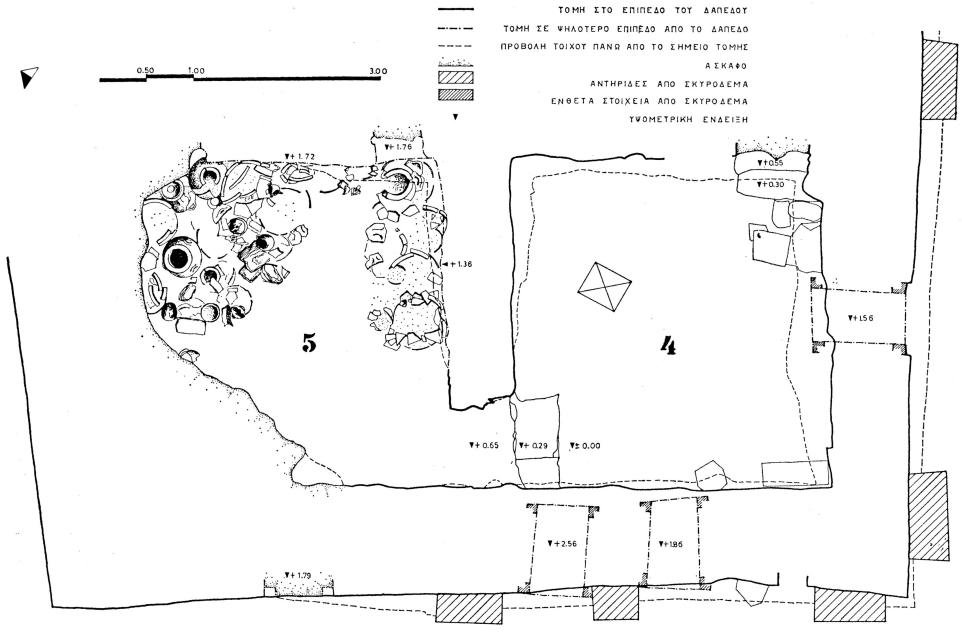


Fig. 11. West House, ground floor: Rooms 4 and 5, drawing made before the 1976 cleaning; the rooms are shown at the end of the 1972 season (Akrotiri Excavations Archives, drawing by K. Chatziaslani; *Praktika* 1976, 313, fig. 2).

('storage jars and minor ware'), lined along the N, E and S walls of the room, whereas the rest of this spacious room was empty (*Figs. 10, 11*).

The steatite discoid **S5** was retrieved during cleaning operations carried out in 1976 at the ground level of Room 5;[52] their purpose was to facilitate restoration of the room's walls and the placement of scaffolding. In that year, pumice was still left along the N wall of the room, whereas in the rest of the room the investigation had reached the floor. The seal was found when cleaning was carried out around two pithoi in about the middle of the E wall; the one in the S contained many small pots, the other rested near the door leading to the adjacent Room 3. On the same day, cleaning continued from that spot to the N part of the room, where another pithos stood. With this information to hand, it is evident that we can place the seal's original location within the NE quarter of the room. Although tempting to pose the question as to whether the seal could have come from the upper storey, this may be ruled out. Since the cleaning took place after the room's contents had been more or less entirely revealed in 1972 — as excavation photographs attest — the seal must have belonged to the original contents of the room. In all probability, the seal was found on the floor, since there is no indication in the daybook that the excavation continued below the floor level.

Commentary: The ground-level Rooms 3c, 4, 5 and 6 are thought to have served as storage spaces.[53] In the year that the room was cleaned more than 90 pots were extracted. A number of vessels, particularly pithoi, still contained carbonized (?) seeds, which means that the space was used partly for the storage of food-stuffs. The large number of pots, some of which were kept inside a pithos, indicates that household pottery was also stored there.

On the basis of typological and stylistic criteria, however, **S5** fits its context dating to LC I in no way, as it most definitely belongs to MM II–early MM III production. The fact that the seal is broken raises further problems, since it may represent a discard.[54] Nevertheless, whether or not the seal was still usable, it must be associated with the lifetime of the building, which was established in the 'mature' MC phase.

Seals S6, S7: Triangle Square

Triangle Square was first revealed under the pumice in 1970[55] and was so named in 1972 because of its triangular contour.[56] Its shape is determined by three buildings: the House of

52 There is no mention of the seal in that year's *Praktika* (1976), which is potentially the reason why in the final publication its association with the West House is reported as only probable (Tzachili 2007a, 281). Information on the cleaning of the room in general: *Praktika* 1976, 310–12, fig. 2, pls. 199, 200. The N wall was exposed and investigated in the following year: *Praktika* 1977, 387–88, pls. 202b, 203a.

53 Doumas 2007b, 40.

54 There are, however, instances of seals still kept and occasionally used for stamping purposes even when broken: *CMS* I no. 160 was a damaged hard stone amygdaloid that was used to stamp the stopper of a stirrup jar at Mycenae 14 times (Krzyszkowska 2005a, 288–89 no. 565a); *CMS* II,6 no. 110 was a damaged rectangular hard stone seal that was used to stamp 139 single-hole hanging nodules at Ayia Triada (Krzyszkowska 2005a, 170–71 no. 333); *CMS* II,8 nos. 96, 317, 366 were damaged seals used for stamping in Knossos (discussion by Pini at p. 14 of the same volume); *CMS* V Suppl. 3 no. 73 was a broken cushion used for multiple, repetitive impressions on a pithos from Livanates in Phthiotis.

55 *Thera* IV, 8, 11–12, pl. 8b.

56 *Thera* VI, 18–19.

the Anchor, Complex Delta (Δ) and the West House; it is the NE–SW orientation of the last that is mostly responsible for its particular shape. As with all the open spaces at Akrotiri, it remains unclear if the shape was due to town planning, or simply represents an area left between buildings, constructed consecutively where free space was available.[57] At the time Triangle Square and other open spaces in the vicinity were revealed, Marinatos called their fill 'the "catastrophe layer", that is, the uppermost occurrence of loose stones over which the *aspa* (the local name for volcanic ash) is absolutely pure. Under the stones earth turned brown from mud-bricks always occurs, and soon begin pottery sherds and further finds.'[58]

The first of the two seals found in Triangle Square, **S6**, appeared in two different publications as a bead. In an article concerning prehistoric jewellery it is described as a marble lentoid bead,[59] while in the recent publication of the small finds from the West House it appears as a faience bead.[60] However, there is absolutely no doubt that it is a lentoid seal, as indicated by its shape and faint traces of engraving. It was reportedly found on 14/9/1972 during sieving. On the day when it was listed in the excavation inventory, there is no mention of it in the daybook. On previous days, however, there is reference to the soil to the E of the House of the Anchor being removed and the two windows of its E façade coming to light. The day after the seal was found, part of the underground sewer in the centre of Triangle Square was revealed and roughly sketched in the daybook; it formed part of the central sewage system, running from the middle of the square towards the NE, probably to meet the part coming southbound from Telchines Road.[61] We may assume, therefore, that the soil sieved in the intervening days was extracted from the area between the House of the Anchor and the West House, i. e. the NW part of Triangle Square. On the following day, the daybook also mentions that the investigation in the square revealed two layers of debris, with a thin layer of pure soil intervening. These layers evidently represent the destructions of the LC I period, the so-called SDL, which caused the level of the open spaces to rise, as abundantly attested throughout the squares and streets of the town.[62]

The second seal **S7**, made of local tuff, was also reportedly found in the 'catastrophe layer' covering Triangle Square, to the SE of the West House.[63] The daybook for 16/9/1972 mentions that two trenches were opened in contact with the SE wall of the West House, with the purpose of installing the modern buttresses to support the West House.[64] In all probability, the seal was found during the opening of these trenches. Based on remarks in the daybooks, the excavator noted: '… the virgin rock is 1.4–1.5 m under the surface of Triangle Square. The trenches for the foundations were opened a bit wider than the thickness of the walls (about 80 cm) … The floor of the Triangle consists not of filling from the catastrophe, but of blackish earth and stones, apparently the natural soil of the

57 Palyvou 2005, 35.
58 *Thera* VI, 7.
59 Televantou 1984, 16–17.
60 Tzachili 2007a, 274 no. 1.
61 Palyvou 2005, 39–43, esp. 41 and fig. 42.
62 Marthari 1984; Palyvou 1984.
63 It was published for the first time in 1993 (*CMS* V Suppl. 1B no. 362); its final publication mentions that it was noted and recorded on the spot (Tzachili 2007a, 281), but in it the seal was apparently confused with **S5**.
64 'Pit B' by the SW corner and 'Pit C' the one in the middle of the façade (Marthari 1984, 120, fig. 1). The same pits are named 'Pit A' and 'Pit B' respectively in a different publication (Palyvou 1984, 140, fig. 5).

pre-explosion island.'[65] The daybook is somewhat more detailed noting debris of 1.85 m of thickness, divided in two layers: a) of 0.35–0.4 m thickness, loose soil, containing a lot of movable finds; b) of 1.65 m thickness, maybe natural soil. Again, the engraved object belongs to a debris layer that postdates the foundation of the West House, which functions as a *terminus post quem*.

Commentary: The retrieval circumstances of the two objects reportedly coming from the debris in Triangle Square are not entirely clear. Because we are lacking specific indications as to their exact findspots and respective contexts, we have to eschew any contextual or dating correlations. Nonetheless, if we accept that both items were retrieved in debris in an open-air space, they were either discarded or lost.

Seal S8: Cenotaph Square (Area of PP 17)

The object listed in the seal catalogue as **S8** was found in the area known as Cenotaph Square or area of PP 17.[66] The area was first investigated in 1969, when the 'Sacrificial Fire' (*pyra*) was detected.[67] PP 17 was opened in 1970, to the NE of the area of the 'Sacrificial Fire', and was described as a shallow trench of 1.5 m depth, which revealed a vaulted cutting in the rock.[68] Investigation continued in 1984,[69] when it was established that the area to the N of Complex Delta (Δ) was a large open-air space, its E part being an elevated terrace formed by debris and held in place by retaining walls to the E and N. One of the purposes of the E retaining wall was to leave a free N–S passage, the street that is now dubbed Daimonon, between the terrace and Xeste 5. On top of the terrace, a structure resembling an EC cist grave was evidently visible in the LC I period. In the next year's season, the vaulted cutting first detected in PP 17 turned out to be part of a series of underground rock-cut chambers; during the latest pre-eruption phase it seems that the chambers were turned into storage spaces for pottery.[70] Also, the grave-like structure exhibited on its surface fragments of EC marble collared jars (*kratiriskoi*).[71] Further investigation within this structure revealed a hoard of EC figurines, along with obsidian artefacts and a number of other EC objects.[72] In 1994, the vicinity of the 'Sacrificial Fire' was further explored.[73] The *pyra* appears to have been included in a rectangular space, which was in use during the EC period, as was the whole area, subsequently to be covered by a MC pavement, and finally to be covered by SDL debris, which formed the Cenotaph terrace.[74]

Seal **S8** was found in 1993 during the investigation of the same area.[75] In that year, a section of the E retaining wall was removed, in order to verify the date of its construction. The

65 *Thera* VI, 20, pl. 32a.
66 Thus named in *Praktika* 1994, 158; Palyvou 2005, 35–38, figs. 34, 37.
67 *Ergon* 1969, 153–55, figs. 192, 193; *Thera* III, 19–24, figs. 2–10, pls. 20–22.
68 *Thera* IV, 8–9.
69 *Praktika* 1984, 346–47, pls. 183b, 184, fold-out pl. 8.
70 *Ergon* 1985, 64–65; *Praktika* 1985, 171–75, fig. 3, pls. 82–86, inserted pl. 9.
71 Listed among a number of stone finds in Devetzi 2008.
72 *Ergon* 1992, 78–80; *Praktika* 1992, 181–85, figs. 3, 4, pls. 78, 79; Moundrea-Agrafioti 2008.
73 *Praktika* 1994, 164–65, pls. 98b, 99.
74 Sotirakopoulou 1999, 17–18.
75 *Praktika* 1993, 176–77, pls. 103, 104a.

Fig. 12. Cenotaph Square: trial trench under Daimonon Street between Xeste 5 and the square's terrace (Akrotiri Excavations Archives; *Praktika* 1993, pl. 104a).

wall was found to contain pottery ranging from the EC II period to the early LC I period. Also, a trial trench was opened under Daimonon Street (*Fig. 12*), which revealed part of the LC underground sewage system.[76] Further below the sewer level, it was established that the bedrock in that particular area was at a deeper level than previously thought, revealed at a height of +23.7 m in PP 17, to the NW of the trial trench, since the trial trench went as far as +21.9 m without having reached bedrock. The trial trench was reported to contain sherds from thick-walled vessels, a fragment of a clay figurine, small fragments of white plaster, some of which were red-painted, or with red or blue bands, a small number of obsidian fragments, bones, shells, insect remains, etc. **S8** was first identified as a faience object. It was found to the E of the retaining wall; the daybook mentions it as a find from the area to the E of Wall 8. The soil was brown, loose, and contained numerous small stones.

Commentary: The area where this object was found is in itself rather unusual and indeed unique, not only as far as Akrotiri is concerned but also in its wider Aegean setting. However, it is unclear if and how **S8** was associated with any of the phases during which the square was in use. It was most certainly found in what appears to have been filling debris for the square, but it is impossible to suggest which chronological phase the filling rep-

76 Palyvou 2005, 42, fig. 42.

resents. One could, however, venture to suggest that an early LC I date — indicated by dating evidence for the retaining wall, as well as the concommitant installation of the sewage system in that area[77] — should probably be set as a *terminus ante quem* for the seal. Nevertheless, the absence of typological parallels for the object itself hinders any definitive judgement.

Seals S9, S10, S11, S12: Complex Delta (Δ)

Complex Delta (Δ) is one of the few buildings at Akrotiri (along with Xeste 3, the West House and the House of the Ladies) to have been thoroughly revealed, albeit not thoroughly excavated. It is considered a 'private' building (as opposed to the Xestai, which qualify as 'public' buildings). However, as its name implies, we are not dealing with a single entity: Delta is a conglomerate of four different 'building units', which are divided and at the same time joined by contiguous double walls.[78] Whether these building units also represent distinct architectural phases remains to be established by further study. That the four units functioned independently from the point of view of their architectural design is shown by the fact that each has a separate entrance.[79] As noted, however, it remains uncertain whether each of the units was truly independent and had autonomy regarding food preparation activities and storage,[80] thus reducing their physical proximity and contiguous walls to mere accident. Moreover, it should be stressed that the definitive identification of each unit as a separate 'household' also remains to be established.

The convenient designations given by Palyvou ('Delta-North', '-South', '-East' and '-West')[81] are used here and imply this division based on architectural evidence. Should future study determine that they are to be treated also as autonomous 'households', then the evidence can be reviewed from that perspective.

77 The underground sewage system detected in different parts of the town appears to date mostly to an early LC I phase, with some parts constructed earlier during a MC-mature phase; however, the sewers in Daimonon Street, of interest here, and the part revealed to the N of the neighbouring Xeste 5 both date to the early LC I phase (Sofianou – Georma forthcoming).

78 Doumas (1974, 199, fig. 1) views Complex Delta (Δ) as a unified entity and he considers the in this study so-called building units as successive architectural phases. He suggests that Delta 'is the result of at least five successive additions to an original core' (Doumas 1983, 48). *Pace* Michailidou 2001, 321–33, where four different units are listed, and Palyvou 2005, 71–83, 92–95, where the building units are designated as 'Delta-South', '-West', '-North' and '-East'. It now seems that Delta is not the only building complex in the settlement: Sector Alpha (A) is also revealed as a complex (see above, pp. 8–9; Moschou – Karnava forthcoming).

79 Palyvou 2005, 71.

80 Nikolakopoulou 2002, 210–14.

81 Michailidou (2001, 321) prefers Unit 1 = Delta-West, Unit 2 = Delta-South, Unit 3 = Delta-East, Unit 4 = Delta-North. Michailidou's numbering could be proven more useful in case the number of units in a complex exceeds the four that match the points of the compass; yet both Complex Delta (Δ) and Complex Alpha (A) do not exceed this number, since Alpha has revealed three units: Sector Alpha (A) = Alpha-South; Western Quarters = Alpha-West; and the newly discovered and baptised Northern Quarters = Alpha-North (Moschou – Karnava forthcoming). Palyvou's designations, however, allow us to immediately localize the specific part of the complex and where its entrance lies.

SEAL S9: DELTA-NORTH, 'CORRIDOR' OPPOSITE THE ENTRANCE

The building unit situated at the N end of Complex Delta (Δ) presents us with a complicated picture, due to the fact that it has not been fully investigated. It was one of the first architectural assemblages discovered in the site in 1967,[82] and one of the first to be excavated in 1970,[83] when most of Delta was revealed.[84]

According to the inventory book (MPTh), the serpentine lentoid **S9** was found 'during the investigation of the corridor to the S of the N entrance'. The daybook, on the other hand, mentions the retrieval of a perforated stone lentoid during the removal of the destruction layer ('pile of stones') from the West Staircase, i. e. the main staircase leading to the first storey of Delta-North, on 25/8/1970. Since the excavator named both the staircase and Room D6 'corridors' in that year's excavation report,[85] it seems that the find tags continued to designate the W space as a corridor, even after the discovery of the staircase, and this is what was copied in the inventory book. If we take the daybook entry as factual, the seal was part of the first-storey contents which crumbled onto the staircase, but not before the staircase was covered with pumice (*Figs. 13, 14*). The daybook entries for the immediately preceding days record the stratigraphy of the staircase. The uppermost layer was soil and stones of 0.3 m thickness ('destruction layer'), containing pottery sherds, floor fragments, a wall painting fragment with a red saffron flower on white background; underneath, a layer of river sediments of another 0.25–0.3 m thickness; and further below, the pumice of 0.9–1.2 m thickness, directly above the stone steps. Fragments belonging to the same wall painting were recovered outside the building, immediately to the W of its W wall, along with pottery sherds and a broken rhyton.

The report in that year's *Praktika* creates a confusion, in that it mentions 'a glandular bead of carnelian about 1 cm long, another lentoid of steatite without any engravings and a corner of painted brick' coming from Room D4.[86] However, Room D4 was never called a corridor in the daybook, and the above finds are not mentioned anywhere in the daybook entries concerning Room D4. In view of the discrepancy between the daybook-inventory and the published account in *Praktika*, it appears more likely that the former should be followed.

Commentary: The examination of the architectural evidence, the movable finds and the floor fragments suggested that there was a room above the ground storey of Room D4,[87] and it was presumably from there that the objects found in this space came. It is not entirely clear what the exact retrieval circumstances and context of **S9** are: it should be noted, however, that it is the only seal found at Akrotiri for which the possibility exists that it came from a first floor context.

82 The N corner of the building unit was initially discovered during the excavation of 'Bronos 1a' (*Thera* I, 34–38, figs. 18, 49–54, colour pl. B5).

83 *Thera* IV, 10–18.

84 *Thera* IV, 10–28, plan I. The building was invariably called 'Sector Delta' and 'Xeste Delta'.

85 *Thera* IV, 13: '… two corridors appeared opposite the door. The one more to the right (west) was filled with pumice up to the highest preserved spot … This soon proved to be a staircase. The left (E) corridor (D6 on the plan) was filled not with pumice but with river sweepings.'

86 *Thera* IV, 14.

87 Michailidou 2001, 331; Palyvou 2005, 82.

Figs. 13–14. Delta-North: the main staircase (Akrotiri Excavations Archives; *Thera* IV, pl. 14a–b).

SEAL S10: DELTA-WEST, ROOM D1A

During the investigation of the greater part of Complex Delta (Δ) in 1970, Rooms D1 and D1a came to light; they were rooms of equal size at both ground and first-storey levels.[88] The first-storey room is 'the largest compartment of the upper floor, the largest known from Akrotiri. Two large rooms, Delta 1a and 1, communicate with the longest pier-and-door partition [*polythyron*] known at Akrotiri; … it has six doors and is 7.3 m long.'[89] The *polythyron* evidently divided a large room into two sections, the N named D1 and the S named D1a. At the ground level a wall achieved the same division of sections and it is probable, although not verified by excavation, that ground-level Room D1 was further divided into another two sections by another wall.[90] Both levels of Room D1a have been thoroughly explored, starting with the first storey in 1970.[91]

88 *Ergon* 1970, 145, fig. 163; *Thera* IV, 18–20, pls. 23b–27.
89 Palyvou 2005, 79.
90 Palyvou 2005, 76, fig. 99.
91 *Thera* IV, 19–20, pl. 26b, which shows the level reached by the investigation in 1970.

The ground level of Room D1a was investigated for the first time in 1974.[92] Although it was never actually described in the preliminary reports, the plan drafted in 1976,[93] along with information recorded briefly in the daybooks of 1975, shows a rectangular room with two piers in central positions supporting the first-storey floor. The piers were surrounded by numerous pots, which were also aligned around the walls of the room. At least six pithoi were counted at first, whereas smaller vessels had been removed during the 1974 excavation; an *asaminthos* ('bathtub') was found in the NW corner[94] next to a fixed structure interpreted as a hearth. Excavation resumed in 1993,[95] when it was discovered that the room also contained c. 150 vessels of various types and sizes, apart from the ones extracted in 1974. The hearth had traces of burning on its surface and an ovoid funnel-mouthed pithos, a skyphos and an amphoroid vase resting on it. In light of the evidence, this particular space is thought to have functioned chiefly as a storage place for foodstuffs, e. g. flour, mainly in the E section of the room; other functions seemingly fulfilled in the same space were cooking due to the presence of the hearth, as well as crop processing, as suggested by a stone quern found next to the *asaminthos*.[96] Nonetheless, since basic rules of sanitation would require the physical separation of cooking and storage installation, it has been noted that the hearth may have been used only occasionally, and then in connection with the main function of that space, namely food storage.[97] To the functions suggested for this room, the weighing of unspecified products can be added through the retrieval of a pair of bronze balance pans and seven lead weights.[98]

The object made of porous black volcanic stone **S10** was recorded in the daybook as having been found in a floor 'cavity' to the E of the E pier (shown in *Fig. 15*). The floor itself in the E section of the room is described as overall poorly preserved, unlike the floor in the W section, which was pebbled and preserved. The exact findspot of **S10** inside the cavity was measured at the time and can thus be placed with precision on the room plan. In the same cleaning, 'various sherds' were collected, some seashells, five small pieces of charcoal, another stone object of ovoid shape with hollow sides, small bones and the fragment of an obsidian blade. The E section of D1a was photographed after its cleaning (*Fig. 16*).

Commentary: In the daybook the floor cavity is interpreted as 'a token of some sort of the floor's destruction, occurring due to pressure exerted in that spot by heavy or voluminous objects'. Such an observation raises doubts as to whether the seal was part of the room's contents, or was embedded in the floor, thus belonging to an earlier context.

92 *Ergon* 1975, 146–48; *Praktika* 1975, 217–18, pls. 190b, 197–204, 206–208a, 209a: following the excavator's untimely death and the commotion that followed, the daybook for the investigation of lower level Room D1a is reported in *Praktika* as lost.

93 Delta-West: plan of ground level Room D1a, end of the 1974 excavation season (*Praktika* 1976, 314, fig. 3, drawing by K. Trakosopoulou).

94 Kriga 2003b, 466, fig. 8.

95 *Praktika* 1993, 180–81, pl. 107a; a more detailed presentation of the room and its contents is found in Papadimitriou-Grammenou 2008, 138–47.

96 Papadimitriou-Grammenou 2008, 138–47.

97 Birtacha 2008, 349–50, where the same is suggested for a similar installation in space Alpha 1. Birtacha also observes that no similar structures were traced in the only three buildings fully excavated so far, namely the West House, the House of the Ladies and Xeste 3.

98 Papadimitriou-Grammenou 2008, 143, fig. 14; Michailidou 2008b, 51, figs. II.1b, II.11–13; 80–86, figs. II.51–56, table II.3.

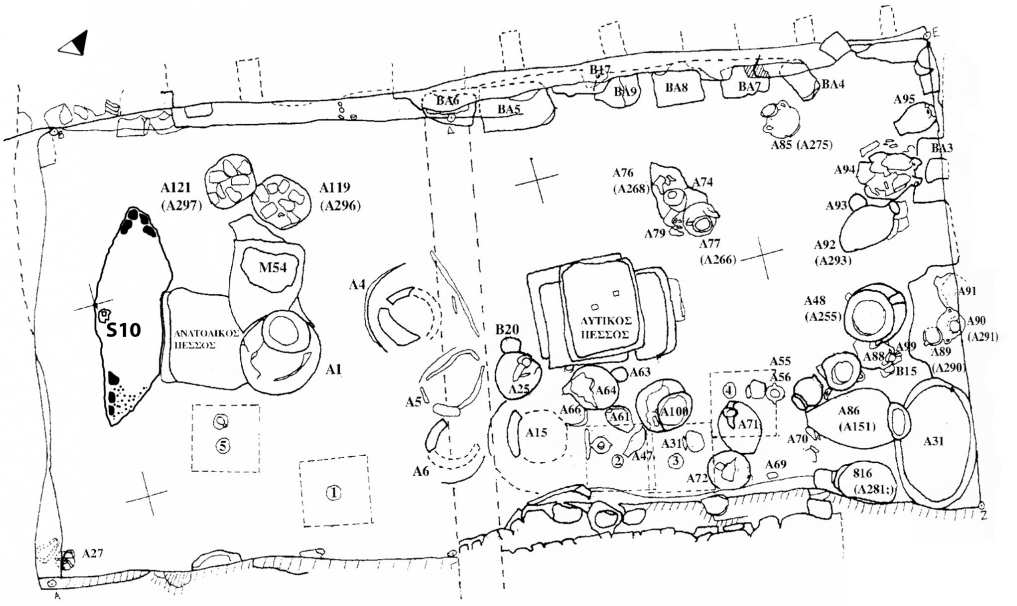


Fig. 15. Delta-West: plan of ground level of D1a, end of the 1993 excavation season. The encircled area to the E of the pier indicates the floor 'cavity' from where **S10** was retrieved. (Akrotiri Excavations Archives, after drawing by V. Isaakidou – M. Fotia – S. Epelly; Papadimitriou-Grammenou 2008, 140, fig. 1).

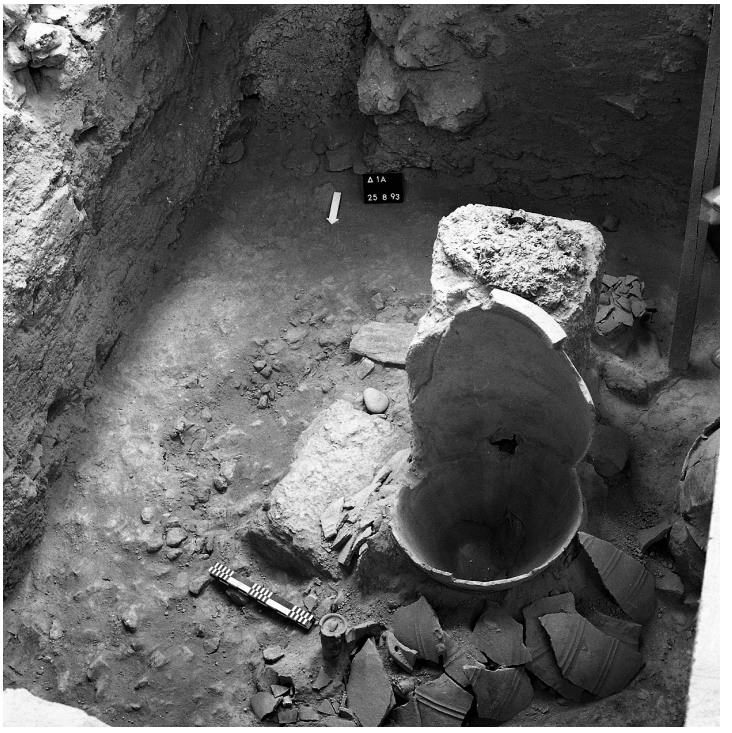


Fig. 16. Delta-West: D1a, E section (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – A. Kambouris).

The daybook mentions that on the day **S10** was found (25/7/1993) the initial goal of investigation had been the removal of debris, mainly dust and soil accumulated over the years since the last time the room had been investigated.[99] However, since we do not know whether the original excavation had reached the floor, we cannot be certain if the layers on or under the floor were removed. In this respect, it is worth noting that in 1993 the E section of the ground level of D1a was found completely empty of whole pots. The daybook suggests that these had already been extracted in 1974;[100] the 150 pots counted from the 1993 excavation actually came from the central (between the two piers) and the W section of the room, which had not been thoroughly investigated in 1974. Thus, it is reasonable to assume that the 1974 excavation at the E section had actually reached the floor level.

The daybook entries, therefore, do not show a definite association of **S10** with the contents of the room, and, consequently, with its suggested function(s). It is also possible that the object belonged to an earlier context.

SEAL S11: DELTA-WEST, ROOM D9.1

Room D9 was first detected in 1970, during the excavation season that revealed most of Complex Delta (Δ).[101] To its S and, as it turned out, inside the room subsequently named D9.1, PP 21 was excavated in the same year, producing 'squared stones, paving-stones, plaster (especially numerous at a depth of 3–3.50 m) and plenty of vessels'.[102] Room D9 was further investigated and was called 'a magnificent store-room' from the outset,[103] since 'over 300 vases' were recovered there.[104] All that was investigated in 1971 were first-storey contexts, and the presence of 'a basement or a cellar' was identified in Room D9.1. Subsequent investigation revealed that the ground level of D9.1 had been turned into an underground room, because the surface level of the exterior space to its E had risen due to backfilling of the adjacent Room D20, which was a ground-level room.[105] Access to the ground level of Room D9.1 was granted through Room D9, which in turn was accessed through Room D1a, making entry a very intricate process.

Room D9.1, excavated in 1973, was found to be 'also full of pottery, but of a finer quality than that stored in Room D17' (*Fig. 17*);[106] 'the first victim of the disaster', namely an entire pig's skeleton, was counted among the finds.[107] The excavator went on to remark that 'the vases were closely stacked one above the other, mostly along the Eastern and Southern walls … by the South wall were dozens of one-handled bowls (kyathoi) … some were manufactured locally …, while others were imported fine products of Minoan origin'; also,

99 The daybook mentions 1974 as the last year during which the room had been investigated; yet another entry in the daybook shows that some cleaning (described as 'dusting', i. e. something extremely superficial) had also taken place in 1985.

100 Whole pots and a number of other objects are shown as coming from D1a in *Praktika* 1975, pls. 201–204, 206–208a, 209a.

101 *Thera* IV, 26, pls. 42b–44a.

102 *Thera* IV, 9–10, plan 1.

103 *Thera* V, 16–17.

104 *Thera* V, 25–26, pls. 43, 44; *Thera* VI, 13, pl. 13b; *Thera* VII, 15.

105 For the description of the extremely complicated situation of Delta-West: Palyvou 1999, 320; 2005, 75–80.

106 *Thera* VII, 15–16, pls. 18b–20.

107 *Thera* VII, pl. 20a: the pig's skeleton *in situ*.

Fig. 17. Delta-West: D9.1, ground level with pottery *in situ* (Akrotiri Excavations Archives; *Thera* VII, pl. 18b).

that 'the first and possibly the earliest Syrian amphora so far discovered on Greek territory' was found.[108] A later study of the pottery noted that Rooms D9.1 in Delta–West, Room D17 in Delta–North, and Room D16 in Delta–South yielded the greatest percentage of imported pottery in the settlement, together with a number of other unique objects.[109] Among the imported specimens in Room D9.1, five rounded cups are thought to have been LH I imports.[110]

Among other finds, 'the room also yielded some stone objects, and a steatite seal … was found during the sifting of the earth removed.'[111] The serpentine lentoid **S11** bore 'one of the ordinary apotropaic themes'.[112] The daybook entry (15/9/1973) leaves no doubt that the seal was found on the floor, although it does not state from which part of the room it came. Before the seal was recorded in the daybook, the pig's skeleton is mentioned as having been cleaned and its consolidation process begun by the conservator S. Papageorgiou. This does not, however, mean that the seal was found in the vicinity of the pig's skeleton: while the conservator was working on the skeleton, workers could have been occupied in other parts of the room.

108 *Thera* VII, 30, pl. 49b.
109 Marthari 1980, 201.
110 Lolos 1990, 54.
111 *Thera* VII, 15.
112 *Thera* VII, 32, pl. 57b.

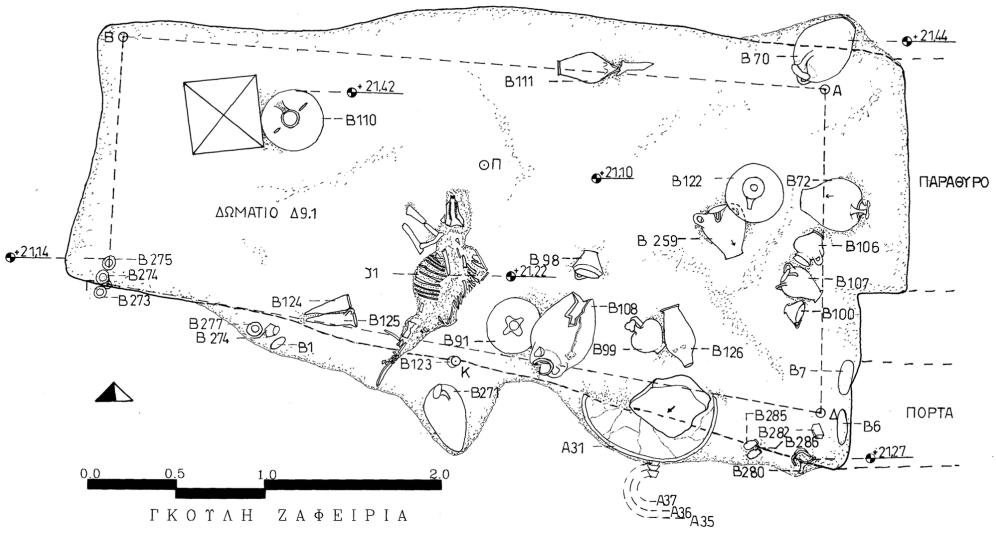


Fig. 18. Delta-West: plan of NPP 21, showing the state in which D9.1 had been left in 1973 (Akrotiri Excavations Archives, drawing by Z. Gouli).

During the excavations for the pillars of the new shelter, NPP 21 was excavated inside Room D9.1 (*Fig. 18*).[113] Some 29 clay vessels, among which part of an *asaminthos* ('bathtub'),[114] along with the pig's skeleton, had been left by Marinatos on the floor of the room. The recent excavations did not contribute greatly towards the clarification of the room's stratigraphy and have shown that the situation was not as simple as was initially presented by its excavator. For instance, during its removal, the pig's skeleton was reported to be missing its upper jaw, a fact noticed already in 1973, which could indicate that the animal had already been slaughtered and that its findspot was, with all probability, its storage space.

Commentary: Room D9.1 has been interpreted by researchers studying Akrotiri as a storeroom reserved for items such as pottery.[115] Questions have also been raised as to whether it had always been a storeroom, or was only turned into one in the wake of the pre-eruption earthquake; since it evidently survived this event undamaged, the room may have been regarded as safe.[116] An original pre-eruption function of Room D9.1 as a specialist storeroom for pottery is supported by the fact that vessels were found stacked in distinct groups along the walls;[117] this is in marked contrast to the variety of objects found piled up in rooms such as D2.

113 *Praktika* 1999, 156, fig. 1, where the position of NPP 21 is indicated on the plan of the site.
114 Kriga 2003b, 470 no. 26.
115 Marthari 1980; Lolos 1990.
116 Nikolakopoulou 2003, 569.
117 Nikolakopoulou 2002, 213; Polychronakou-Sgouritsa 2008, 152, nn. 12–13.

The contents of spaces D9 and D9.1 have also received attention because they contained a large number of rhyta,[118] while the sizeable number of cups implies use by numerous individuals. The great variety of objects, most of them 'precious', has led to the notion of a cult repository, with the pots being subsequently used either in the spacious Room D1–D1a, or 'in processions throughout the town'. Alternatively Koehl advocated that the contents should at least be regarded as 'symbolic or high status'. There is a problem with this interpretation, which Koehl himself duly notes:[119] if objects such as rhyta have a restricted distribution in Cretan sites, Akrotiri presents a striking difference in that they have been found almost everywhere. Recent excavations have continued to confirm this observation, producing a steady flow of relevant finds, at least as far as the LC I period is concerned. It is interesting to note that rhyta, as known from Minoan contexts, do not constitute part of the local Cycladic ceramic repertoire, since they do not appear in Akrotiri before LC I.[120] Furthermore, buildings which are thought of as 'public', 'stately' or, at least, as hosting communal activities, such as Xeste 3, present us with an extremely low number of rhyta compared to any other 'normal' building in the site. We should, therefore, avoid making unwarranted assumptions regarding inherent meaning or function when evaluating vase shapes transferred from one culture to another.[121] If we must insist on designating these vessels as 'symbolic' or 'high status', then we ought not do so outside their original context, i. e. the Neopalatial period in Crete.

At the present state of affairs, the characterization of Room D9.1 as a storeroom is the most plausible, although the retrieval of stone objects, the fragment of an *asaminthos*, as well as two lead weights,[122] and even an animal that could have been slaughtered, indicate that not only pottery was stored there. If this interpretation is correct, then we have a room reserved for storage located at the rear of the building, some distance from the entrance. This may also have a bearing on the presence of the seal in the room, namely that it could be among the items stored therein.

SEAL S12: DELTA-SOUTH, ROOM D16

Ground level Room D16 belongs to the building unit Delta-South. The room came to light during the 1971 excavation season, the second season of intensive research in Complex Delta (Δ).[123] It was termed from the very beginning 'another precious store-room containing all kinds of objects'.[124] It was reported to be 'unusually large', measuring 4.9 × 7.1 m, i. e. 34.8 m², one of the largest rooms in Akrotiri,[125] and preserved a stone column base in the centre. The construction of the ground-floor Room D16 or at least part of it, is ascribed to

118 Koehl 2006, 295.
119 Koehl 1990, 354–56.
120 Knappett – Nikolakopoulou 2008, 35.
121 Papagiannopoulou 1995, 213, fig. 5, where in Xeste 3 the rhyta total is six, with zoomorphic rhyta being completely absent, whereas the West House produced 38 rhyta in all.
122 Michailidou 2008b, 86, figs. II.51, II.57, table II.3. The author, however, suspects that these two weights could be part of the set of weights discovered in Room D1a.
123 *Thera* V, 16–17, 20–26, pls. 14c–20, 28–50a.
124 *Thera* V, 16, 20–22.
125 Palyvou 1999, 229.

the latest LC I phase, and is thought to have followed the SDL.[126] No architectural remains indicating the existence of a floor above were recovered in the pure volcanic ash that filled the room.[127] This kind of filling suggests that the roof of this room was still in place when volcanic ash and pumice began falling on the houses.

The floor, at first count, was found covered with more than 300 pottery vessels and many more items, some of them of unique materials and craftsmanship.[128] The final total of pots in Room D16 was '450 vases, including jars, ewers, jugs, cups, a large variety … grouped in various categories: good pots, bad pots, imported pots, ewers together, and so on'.[129] The brown-reddish jasper lentoid **S12** was the first seal from Akrotiri to appear in preliminary excavation reports.[130] It was retrieved during the 1971 excavation season 'in the sifting of the floor's earth'.[131] The daybook entry states that it was found in the sieving of the soil from the E wall.

In an effort to describe and interpret Room D16, Marinatos reported that 'fragments of vases lay accumulated everywhere, but especially along the walls', that 'the bottoms of theses vases were regularly placed on the floor and almost always contained seeds, flour or other organic matters (greasy, blackish earth)', that 'some of them … could have been standing on shelves along the walls.'[132] He also suggested that the pots 'were already broken when transported from somewhere else'; furthermore, 'most of the fragments were missing'. However, his report was drafted soon after the completion of the room's excavation and did not see the full restoration of all the pottery. The concentration of pithoi around the central column was further seen as an indication of the hazards caused by the earthquake.[133]

By contrast, the daybook entries make clear that objects were found on the floor of Room D16 in what appear to be clusters (*Fig. 19*). A cluster in the SW corner comprised, *inter alia*, triton shells, rhyta, a pair of unique ostrich egg vessels,[134] and a hoard of stone vessels. It was probably this cluster that fostered the characterization of this room as a cult-related context, particularly by scholars familiar with Minoan material remains in Crete. However, the rest of the room contains objects — some well known from other contexts, others less familiar — that relate to various activities, such as crop processing and the storage of organic materials. The NW corner presented another cluster of nine medium-sized clay vessels and a marble quern. Four of the vessels are described in the daybook as 'spouted', two were imported strainers, one was a nippled jug; at least three contained organic residues, while at the same time containing other vessels, such as cups, a bronze object, a lead disc weight,[135] and another nippled jug. The NW cluster ended with a pithoid vessel containing 18 complete askoi, along with a cup, a small pithamphora and a set of

126 Doumas 1978, 780; Palyvou 1984, 136.
127 *Thera* IV, 53; V, 16; Palyvou 1984; Palyvou 1999, 236; Michailidou 2001, 316–18.
128 *Ergon* 1971, 186–93; *Thera* V, 21–22, 30–36, pls. 31b, 60a–b, 61a, 62a–b, 66–79, 81–87a.
129 Doumas, in response to Koehl 1990, 362.
130 Seal **S9** had been found in the previous year, but was reported as having no 'engravings' and did not appear in print (*Thera* IV, 14); in fact there are only faint traces of its engraved motif.
131 *Ergon* 1971, 204, fig. 206; *Thera* V, 21, 36.
132 *Thera* V, 20–21.
133 Polychronakou-Sgouritsa 2000, 79; Nikolakopoulou 2003, 568–69.
134 Bichta 2003, 542–43.
135 Michailidou 2008b, 50, 96.

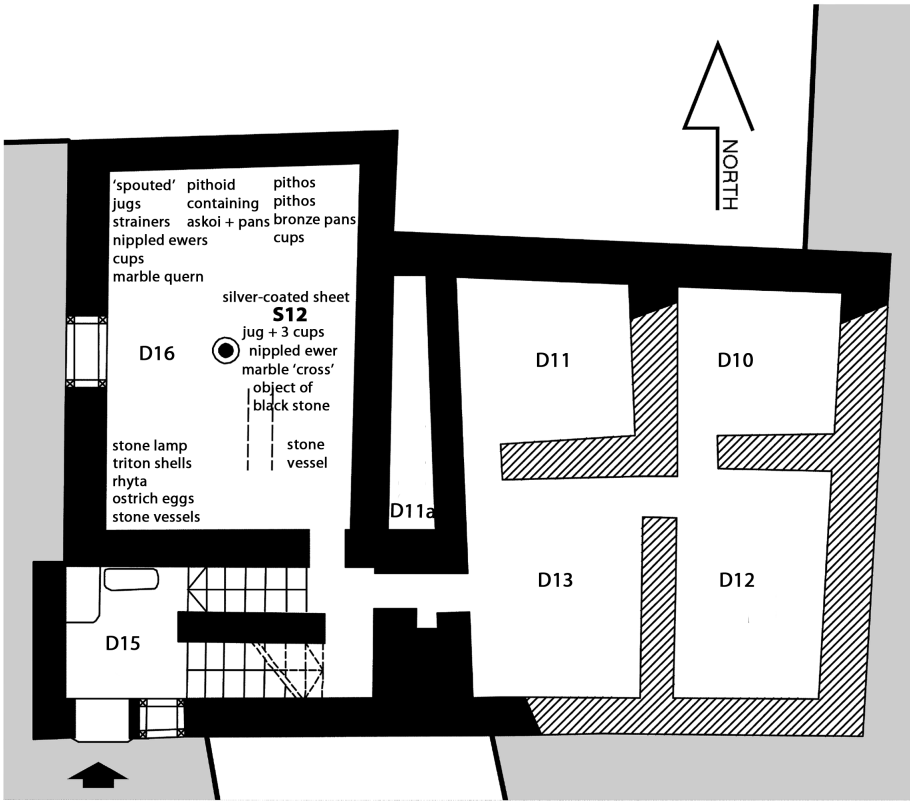


Fig. 19. Delta-South: D16, with (approximate) findspots of clusters of objects based on information from the excavation daybook (adapted from Palyvou 2005, 72, fig. 90; image courtesy of INSTAP Academic Press, Philadelphia, PA, USA).

balance pans of the smallest size recovered so far at Akrotiri,[136] found around the middle of the N wall. A third cluster was found in the NE corner and comprised two pithoi, one of which contained organic residues, while behind it was a lead ring and a perforated, unfired clay cylinder.[137] The second pithos contained a cup and an amphora; two more vessels and an incense burner were in the vicinity (*Fig. 20*). A second pair of bronze pans, a balance set of the largest size so far recovered at Akrotiri, is reported to have come from inside one of the pithoi.[138] A fourth cluster is described in the middle of the E wall, from which the soil in which seal **S12** was found came. This cluster contained an object of black stone, a marble 'cross',[139] two unspecified vessels and a nippled ewer; apart from seal **S12**, a silver-coated sheet was retrieved in sieving.

Seal **S12** was found two days before the excavation of Room D16 was reported as completed; thus it was definitely among the finds resting on the floor of the room. Even if the

136 Michailidou 2006, 258, fig. 24; Michailidou 2008b, 49–50, figs. II.1b, II.2, II.9.
137 Not mentioned in Tzachili 2002–03 or Tzachili 2008.
138 *Thera* V, 33–34, pl. 79; Michailidou 2006, 258, fig. 24; Michailidou 2008b, 49–50, figs. II.1a, II.5–8.
139 *Thera* V, pl. 31a: D16, middle of E wall.

clusters just described had been brought from elsewhere, they were doubtlessly among the first to be placed there; having been found, however, under layers of more vessels, it is more probable that they were among the room's original contents.

Commentary: The wealth of movable finds in Room D16 has prompted a variety of interpretations as to its character and function. The 18 small *askoi* of Minoan manufacture, accompanied, *inter alia*, by a balance set, first led Marinatos to regard the items as 'merchandise'.[140] For Doumas the architectural similarities of Room D16 with Room A1 in Sector Alpha (A), both having a column base and a sizeable window overlooking the street, as well as similarities in their contents, further strengthened the case for Room D16 as a locality for commercial trading activities.[141]

However, the additional activity of the 'squatters' hinted at by Marinatos, that of moving items to rooms unscathed by the earthquake, with Room D16 probably among them, did not seem to involve damaged items. In such cases, the inhabitants seem only to have salvaged undamaged objects;[142] regarding pottery in particular, there is simply no sense in collecting and transferring vessels all in pieces. In addition, the number of pots recovered is not so impressive by Akrotiri standards, especially given the fact that Room D16 is one of the largest rooms on the site, of a little less than 35 m², as mentioned earlier. A comparable number of pottery vessels, some 380, was recovered in the considerably smaller Room D18a, which measured only 8 m².[143] And some 200 were found during the excavation of NPP 80, where only a section of a room measuring a little more than 5 m² was investigated; the room unearthed qualifies as a pottery storeroom, since it contained nothing other than stacked pottery.[144] Therefore, the case of Room D16 does not readily lend itself to a potential interpretation as an archaeological context affected by the 'squatters' activities.

The picture of a sea of broken vessels presented by the excavator appears through the daybook entries to be true mainly for the upper layers of debris inside the room (*Fig. 20*). The fact that these were all broken could be explained by a fall from higher up in the room, e. g. if kept on shelves. Alternatively, they might have sustained the full weight of the roof covered with volcanic ash, i. e. depending on the violence of the collapse. The daybook descriptions concerning the actual floor deposits, however, speak of pottery that was at times intact, at times broken to the degree of missing a spout.

Another line of interpretation has been offered by researchers familiar with Minoan material, who have tentatively identified D16 as a room connected with cult practices. Warren suggested that the room — or at least its SW corner — may have been a shrine or a shrine-store, due to 'the rich collection of stone vessels'.[145] Poursat saw it more as a 'shrine storeroom or repository', since it contained 'the most precious objects, made either

140 *Ergon* 1971, 189, fig. 226.

141 Doumas 1983, 51; in response to Koehl 1990, 362.

142 Nikolakopoulou 2003, 562–65, where the concentrations of intact objects in various open areas of the settlement are listed; also, 568–70, where a lengthy catalogue of rooms filled with intact objects is presented. Nonetheless, the instance of Room D16 is mentioned with reservations, as a probable instance of items transported already damaged into the room (570).

143 Polychronakou-Sgouritsa 2000, 83.

144 Moschou – Karnava forthcoming.

145 Warren 1979, 105.

Fig. 20. Delta-South: D16, NE corner (Akrotiri Excavations Archives).

by local or by Minoan workshops and in that case imported'.[146] The co-existence of triton shells along with the ostrich-egg rhyta in the same room has also led Sakellarakis to speak of their use 'in cult practices'.[147] The high number of rhyta, along with a great variety of objects, most of them 'precious', prompted Koehl to identify the room with a cult repository.[148] He suggests (along the same lines as for Room D9.1) that cult objects could have been distributed to participants from the large window, for rituals involving libations with perfumed oil to be performed in open spaces. A basic problem with these interpretations is that they are formed from a Neopalatial perspective. Whatever is 'cultic' or 'ritual' in Crete is not necessarily the same in Thera; these items do not necessarily retain their original, meaningful, ideology-laden Cretan significance in an entirely different environment.[149] Furthermore, these interpretations can only be applied to a portion of the room's contents.

With this last observation in mind, the impressive variety of objects retrieved from D16 finds its most complete explanation in the characterization of the room as a storeroom for items to be traded. This explanation can account for the co-existence of the numerous heterogeneous items of such high quality and social value, some of which were also imported; it can also account for some of these being unique and unparalleled, and thus so far elud-

146 Poursat 1990a, 125.

147 Sakellarakis 1990, 289–95.

148 Koehl 2006, 295. Koehl considered the possibility of a context *in situ*; however, he suggests that the original storage place of items considered valuable, such as the rhyta, would have been elsewhere, perhaps even upstairs, so some sort of transfer should probably not be excluded (Koehl 1990, 357).

149 See relevant discussion for Room D9.1, pp. 30–33.

ing interpretation, such as the marble 'cross'. In addition, it can account for the presence of two different balance sets and the unbaked clay cylinder, the former for items to be traded by weight, the latter used as a possible accounting device. Finally, the interpretation as a 'shop' can even accommodate the presence of organic residues in some of the vessels, meaning that not only were the objects in the room meant to be traded, but perhaps also their contents.

Seal **S12**, which is of interest here, cannot be directly connected either to the suggested 'cultic repository' at the SW corner of the room, or to the suggested 'merchandise', which is highlighted by the presence of two pairs of balance pans in the N and NE part of the room. The immediate context of **S12**, constituted by an as yet obscure object of black stone, a marble 'cross', three clay vessels and a silver-coated sheet, is not particularly enlightening either. The presence of the seal in this particular room can be seen as either an object to be traded itself, a suggestion supported by its pristine condition, or as an administrative tool, i. e. assuming that something was being controlled and/or stamped on the spot with this seal.

Seals S13, S14: Xeste 3 and its Surrounding Area

The imposing building standing near today's entrance to the archaeological site, at its southernmost extremity, is one of the few buildings at Akrotiri to have been thoroughly excavated. We know that it is not unique, inasmuch as three more buildings of similar architecture have been identified to date, though these have not yet been investigated. However, its special status in the life of the town is demonstrated not only by its outstanding architecture — a three-storey building constructed chiefly of ashlar masonry[150] — but also through its contents: wall paintings in practically every room and movable finds that differ from those found elsewhere in the settlement.[151] The particularity of Xeste 3 was noticed early on, when it was described as 'a building of public use …, (where) signs of private habitation were scarce'.[152] Although its excavation has been completed, the final publication, still pending, should shed more light on its exceptional character.

Two seals are associated with Xeste 3, one of which was found in its interior and one in the Square of the Benches.

seal s13: square of the benches

Xeste 3 was originally detected in 1969, during the excavation of PP 4, which at the time was meant to host a Dexion pillar for the protection of the nearby Building Gamma (Γ);[153] from the outset the excavator characterized it as an 'interesting building'. A brief investigation followed in 1971,[154] which revealed much of its external perimeter. In 1972 two PP (47,

150 The upper storey appears to have a height of more than 3 m, as suggested by the recent reconstruction of wall paintings that decorated it (Doumas 2009–10, 13–21, figs. 13–16).

151 Doumas 1983, 49, 106–08; 1987, 155; Papagiannopoulou 1995; Michailidou 2001, 334–60; Palyvou 2005, 54–62; Vlachopoulos 2008.

152 *Thera* VII, 23.

153 *Thera* III, 26, pl. 3.2.

154 *Thera* V, 26–27, fig. 4, pls. 50b–53. The building was initially called 'Ashlar-Masonry Building (Ξεστή) E'.

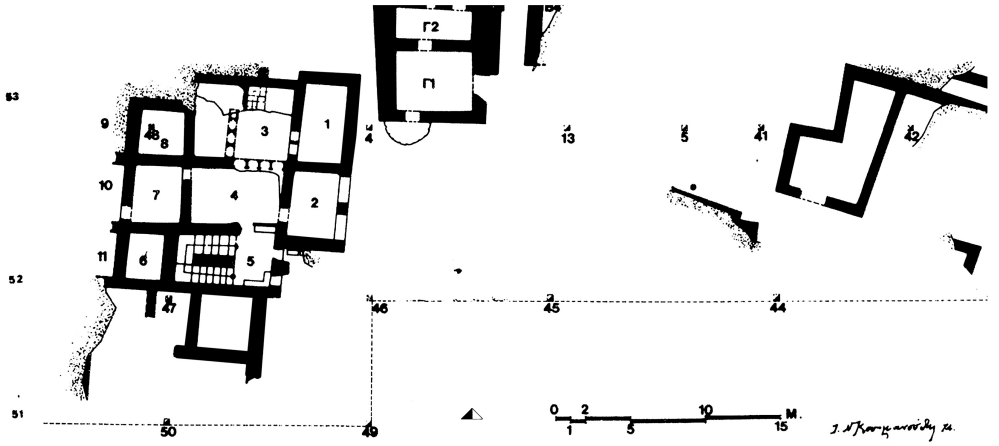


Fig. 21. Xeste 3, as revealed after the 1973 excavation season (Akrotiri Excavations Archives; *Thera* VII, plan B).

48) were opened for the shelter covering the newly-discovered building;[155] after a number of trials in what proved to be 'Corridor 5', these were opened in what we now know as the S exterior side of the building and inside Room 8 respectively.[156]

The building became the focus of investigation in 1973, when most of its plan was revealed, and innumerable fragments of wall paintings were retrieved (*Fig. 21*).[157] The clay seal **S13** was found while the area to the S of the building was being investigated. The daybook entry records it as coming from 'the S area of the destruction layer, to the S of corridor 5'. From the above phrasing, it is not entirely clear whether the daybook's description means that the seal was found inside 'Corridor'-entrance 5 or to the S of it, and to the S of the Xeste in general. It seems more likely that it was found outside, because on days prior to the retrieval of the seal the only work carried out inside 'Corridor 5' was the detailed recording and on-the-spot conservation of wall painting fragments.[158]

The area to the S of Xeste 3 has been investigated on a number of occasions since then, revealing another building to its SW, the House of the Benches,[159] and a square to its S, the Square of the Benches. It was in this open space that Marinatos first discovered what he described as a 'troglodytic' installation. A high number of stone tools (hammers, grinders, anvils, etc.) were found scattered in a limited area,[160] and rough walls were built here and there, using stones from the destruction layer of the adjacent buildings (the plan in *Fig. 21* actually presents these walls as part of Xeste 3, a misunderstanding corrected in later drawings).[161]

155 *Thera* VI, 16–67, pls. 23, 24b–c.

156 The PPs appear on the next year's plan: *Thera* VII, plan B. The wall paintings found in them come from the main staircase and Room 3, the 'lustral basin' (Vlachopoulos 2008, 465 fig. 41.51).

157 *Thera* VII, 22–38, figs. 3, 4, colour pls. A–L, pls. 2, 30b, 32–42, 47c–d, 52c, 53, 54b, 55a–b, 56d, 58–66.

158 *Thera* VII, 25, pl. 39a, the 'Hunter'.

159 *Praktika* 1990, 234, pl. 145b.

160 *Thera* VII, pl. 33a.

161 *Thera* VII, 22, pls. 32b, 33a. The area was reinvestigated in 1990, without any further insights as to the purpose of the stone tools (*Praktika* 1990, 234–35, pl. 147a).

Fig. 22. Square of the Benches: plan of the stone piles covering the square. PP 47 (marked by an X inside a rectangle) is exactly to the S of the wall dividing the staircase ('Corridor 5') from Room 6 of Xeste 3 (Akrotiri Excavations Archives, drawing by V. Isaakidou; *Praktika* 1993, 171, fig. 3).

Drawing and removal of the fallen stones in the SW corner of Xeste 3 took place in 1992,[162] and a second drawing was drafted in 1993, showing the stone piles in the Square of the Benches in much the same condition as they were left in 1973 (*Fig. 22*). The round object visible in the middle of the plan is a stone circular basin recorded in the 1973 daybook as having been found in a distance of 4.2 m from the S wall of the Xeste, some days before the seal was found. The clay seal **S13** was, therefore, found during the investigation that brought the stone piles covering the square to light. The investigation in 1993 showed that the stone tools lay on top of the Xeste debris, which accumulated after an earthquake; since the debris at that specific spot of the settlement had not been cleared by the inhabitants, we can assume that the earthquake responsible for the destruction was probably the latest, the one which preceded the final eruption.

Commentary: In light of this information, the clay seal **S13** was either being worn or used in the Square of the Benches until the very last moments of the settlement's existence, or else it belonged to the contents of Xeste 3 until most of the upper levels crumbled due to the pre-eruption earthquake. Since the daybook notes that the seal was found in 'the S area of the destruction layer', i. e. at considerable distance from the Xeste, the first suggestion appears more plausible. The exact circumstances of the object's retrieval cannot be recreated, since the daybook entries are not helpful in this respect.

162 *Praktika* 1992, 180–81, fig. 3, pls. 76, 77.

SEAL S14: XESTE 3, DOOR BETWEEN ROOMS 13 AND 14

On the basis of architectural, iconographical and other archaeological evidence, the ground storey and the first floor of Xeste 3 seem to have had distinct E and W sections, with the former exhibiting elaborate characteristics and the latter having a plain construction.[163] The E part is viewed as 'public' and 'ceremonial', whereas the W as a 'service area'.[164] Such a distinction has not been suggested for any other building in Akrotiri and, therefore, we have no means of comparing it with any other evidence.

Since the building is one of the few fully excavated at Akrotiri, we can be sure that only a single seal was among the contents at the time of the final destruction. The black steatite disc **S14** was found in the W part of the building, in association with the ground-level floor and the door between the adjacent Rooms 13 and 14 (*Fig. 23*). Room 13 had all been investigated through to the floor of the ground level in the final year of the excavations led by Marinatos (1974). It had yielded a small number of pottery vessels — six nippled ewers, one bridge-spouted jug, one 'teapot', one amphora, two pithoi, and two other vessels — without any indication as to from which level these originated.[165] Room 14 was first revealed in 1973 on the level of its first floor, and was falsely thought to be communicating with Room 11 through a door; also, what was initially thought to be a door to another room to its S, turned out to be a first-floor window.[166] This particular room was further investigated in 1987,[167] again on the level of its first floor, where a door leading to Room 13 was discovered and consolidated.[168] The debris contained architectural members, such as worked stones, stucco fragments and bases for *polythyra* (pier-and-door partitions);[169] also, fragments of three or four pithoi and a LM jug, seashells, an obsidian arrow-head and a flint blade. Moreover, it produced fragments of a wall painting with rosette patterns in relief.

The steatite seal **S14** was retrieved in 1990, when the investigation of Room 14 continued.[170] The seal was found in the sieving of the soil covering the door in the N wall of the room, which led to the adjacent to the N Room 13. On this occasion the investigation was limited to the ground-level room, which had the same plan as the room of the first floor, much like all Xeste 3 rooms did. Room 14 ground level also had an opening measuring 1.8 × 1.8 m[171] leading to Room 15 to its S. At some point in its history, this opening had been blocked, leaving Room 14 as the end-point in the building's ground level.[172] Again, movable finds were poor and included soil and rough stones, animal bones, shells, obsidian flakes, carbonized material and pottery sherds, i.e. debris material. Apart from pottery sherds and plaster fragments, the only other finds mentioned in the daybook, in close association

163 Palyvou 2005, 59, 61.
164 Doumas 1987; 1992; Vlachopoulos 2008, 451.
165 *Praktika* 1975, 222–23, pls. 194–196a. The types and numbers of pottery vessels are found in Papagiannopoulou 1995, 214, fig. 7.
166 *Praktika* 1975, 223.
167 *Praktika* 1987, 244–45.
168 Discrepancies can be observed between the general plan of the site (p. xvii) and Palyvou's more recent architectural study of the settlement buildings (2005) that is followed in the present study. The architectural study of Xeste 3 is on-going, so more information will hopefully derive from it in the future.
169 Michailidou 2001, 360, fig. 269.
170 *Ergon* 1990, 113; *Praktika* 1990, 233–34.
171 *Praktika* 1990, 233.
172 *Praktika* 1993, 166.

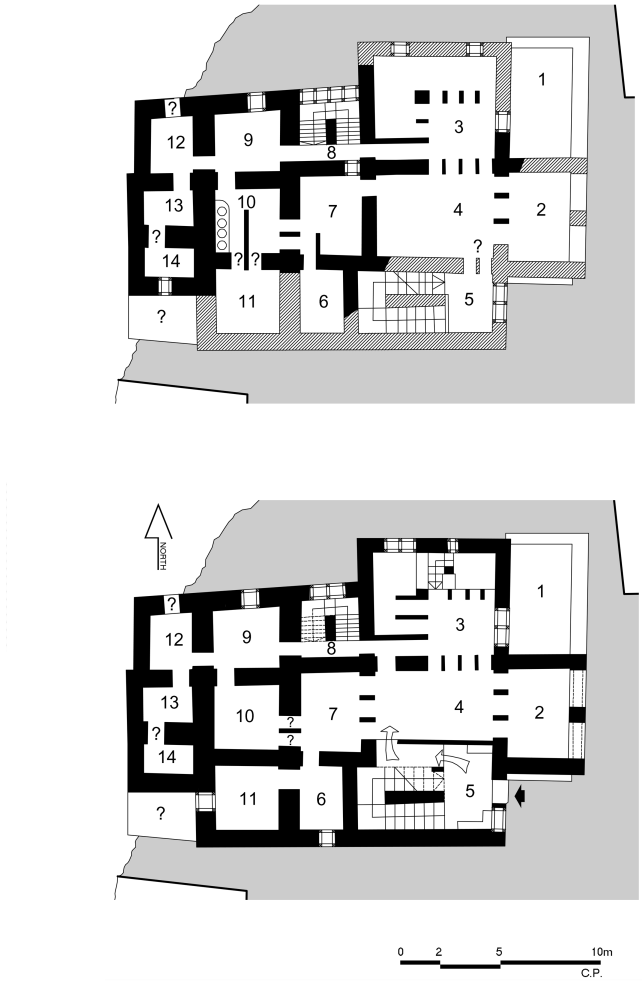


Fig. 23. Xeste 3: plan, ground floor and upper floor (Palyvou 2005, 55, fig. 62; image courtesy of INSTAP Academic Press, Philadelphia, PA, USA).

with the seal, were a number of obsidian fragments. Fragments of relief wall paintings were again retrieved. No floor was found at the ground level of Room 14, with the excavation reaching –0.2 m from the threshold of the door between Rooms 13 and 14.

Commentary: The fragments of a relief wall painting, found amidst the debris material of the first and the ground levels of Room 14, are important for our understanding of the room contents. The yellow-blue rosettes inside blue lozenges in relief are unique among the Xeste 3 wall paintings,[173] and are thought to belong to the second-storey decoration of

173 Although not unique within the settlement: fragments of a relief rosette pattern were discovered embedded in the floor of a room of the House of the Ladies (Televantou 1994, 361).

a room tentatively placed above Room 9, where the majority of fragments were found.[174] The fragments were found in various rooms of the W section of the Xeste, namely Rooms 6–14,[175] and as far as Room 15.[176] This dispersal shows both the extent of the second-floor destruction and disturbance of contexts inside the W rooms of the Xeste. In light of this information, it is far from certain whether the seal was part of the original contents of the room or belonged to the contents of one of the upper-level rooms.

The preliminary study of the pottery of Xeste 3 produced a total of only three pots from Room 14: a cut-away jug, a bridge-spouted jug and a pithos.[177] Xeste 3 appears to be one of the 'poorest' buildings in the settlement in terms of pottery, but this particular room has yielded one of lowest counts in the building. Whatever the purpose of this space in the very back of the building, its movable finds provide few clues.

Seal S15: Building Iota Beta (IB) (NPP 44A)

NPP 44A was opened in 1999–2000 in the S sector of the archaeological site and outside the S limit of the old shelter, in an area never previously investigated.[178] The buildings nearest to the NPP are Building Iota Delta (IΔ) to its N[179] and Building Iota Beta (IB) to its NE.[180] The N side of NPP 44A is located c. 12 m from the N façade of Building Iota Beta (IB) and some 20 m from that of Building Iota Delta (IΔ). In view of the close proximity with these two buildings, it seems likely that the room discovered in the excavation of NPP 44A in fact belongs to one of the two.

The excavation of the NPP revealed a ground level room of a LC I building, which was founded on the bedrock (*Fig. 24*). Two crossing walls established the S and W limit of the room, which occupied the E half of the NPP and showed evidence of further interior spaces to the E. In addition, a vertical clay drain pipe was found embedded in the W wall. In similar instances throughout the settlement,[181] the pipes ended in the central sewage system,

174 Vlachopoulos 2008, 454, figs. 46a–b, 51.

175 Michailidou 2001, 360.

176 *Praktika* 1993, 166–69, fig. 2; this drawing shows the interior of Room 14 before the 1987 and 1990 excavation seasons (compare the exact same drawing, showing Xeste 3 in 1978, in Palyvou 1999, 353, fig. 191).

177 Papagiannopoulou 1995, 214, fig. 7.

178 *Praktika* 1999, 156, fig. 1, where the position of NPP 44A is indicated on the plan of the site; further, *Praktika* 1999, 164, figs. 4–5, pls. 97b, 98.

179 The building is still unnamed in *Thera* VII, plan B, and *Praktika* 1975, 227–29, fig. 3, pl. 205a. Together with the building to its E they were jointly named Building Iota Beta (IB) in *Praktika* 1994, 157, fig. 1, but separate names were assigned to them in *Praktika* 1995, 132, fig. 2. In *Praktika* 1999, 175, NPP 44 (like PP 44) was opened inside the building. Palyvou 1999, 35 and 2005, 28 assigns no particular name to it. However, a drawing of its N façade appears under the erroneous denomination 'House IB' in Palyvou 2005, 99, fig. 140.

180 See above, n. 179. A photograph of the building is published in *Praktika* 1975, 227–29, fig. 3, pl. 205b. The building appeared in *Praktika* 1985, inserted pl. Theta, as 'South House' and this is also followed in Palyvou 2005, 98–100.

181 The clay pipes in the N wall of Gamma 7 (Building Gamma) were discovered during the excavation of PP 2: *Thera* III, 26, 51–52, fig. 29, plan IV. The same system was seen in the W wall of Delta 7 (building unit Delta-North): *Thera* IV, 12, 15, pls. 10b, 11b, 18a; additional information from NPP 15, opened in 2000: *Praktika* 1999, 156, fig. 1, where the position of NPP 15 is indicated on the plan of the site. Both instances concern exterior walls overlooking Triangle Square and a narrow alley (Gamma 8) respectively.

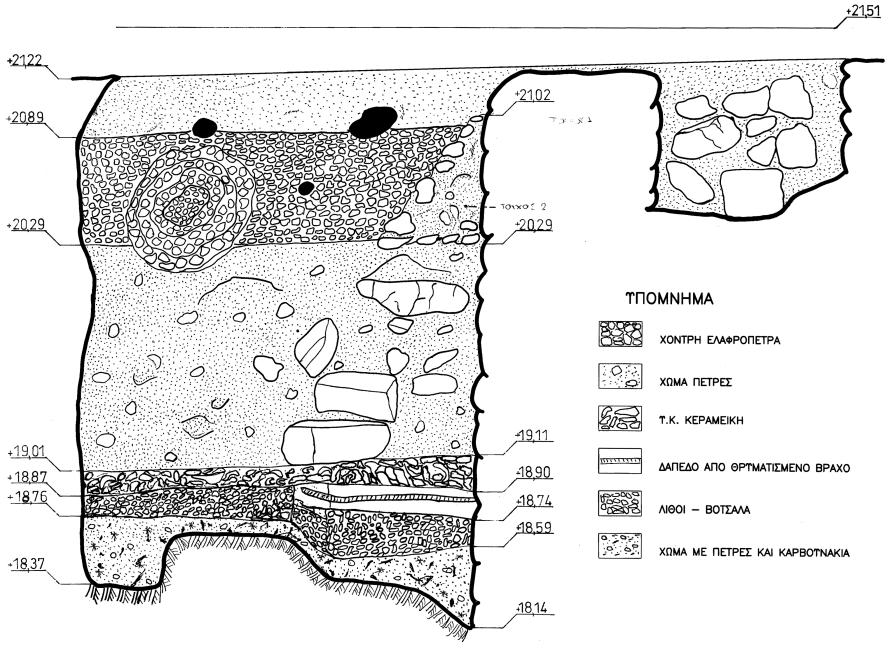


Fig. 24. Section of NPP 44A, situated to the S of Building Iota Beta (IB) and Iota Delta (IΔ) (Akrotiri Excavations Archives, drawing by E. Damigou).

Fig. 25. NPP 44A: interior of the ground level room on 17/2/2000, the day when *Petschaft* **S15** was found. The arrow and scale rest on the surface of the bedrock, which was revealed in the E section of the room (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

which crossed under the streets of the settlement.[182] A recent study showed that the central sewage system was constructed sometime in the early LC I phase but prior to the SDL[183] and fixed structures, such as pipes embedded in walls, closely followed its construction. The investigation in NPP 44, which was opened to the S of Xeste 4 and between Building Iota Beta (IB) and Iota Delta (IΔ), revealed part of this underground sewage system; a branch headed S–SE, apparently following the road between the two buildings. Thus, the W half of NPP 44A seems to have been an open space, namely a street, along which a branch of the central sewer, coming from the area of NPP 44, ran. We suggest that the room revealed in NPP 44A belongs, in all probability, to the Building Iota Beta (IB), and is situated near the W limit of this house. The embedded pipe gives also a *terminus ante quem* for the construction of, at least, this part of the building, and that is the SDL.

The interior of the room was interesting, in that it contained a homogeneous layer of max. thickness 0.36 m of LC I pottery,[184] which rested broken on the floor, along with a number of other items: a bronze dagger,[185] a carnelian object, an ivory pommel[186] and wooden wedges. The daybook registers the presence of stones, plaster fragments and traces of numerous pits, which once held wooden beams, in the destruction layer; these seem to indicate the existence of at least one upper floor. The room had a floor of crushed rock, partly preserved in the W half of the space; on the E half, the bedrock was revealed after the removal of brown, humid soil, containing small stones (*Fig. 25*). It was in this layer, interpreted as the floor's substratum, that seal **S15** was found; therefore it has no bearing on the room's contents or presumed function. The layer contained pottery sherds, animal bones, seashells, plaster fragments with red-coloured surface and a rounded sherd of clay with a suspension hole (*Figs. 26, 27*).

Commentary: When seal **S15** was included in the *CMS*, a 'MC III' context dating was suggested,[187] presumably based on a tripartite system of dating MC phases. A closer look at the pottery of the respective *locus* indicates that the sherds should be identified with a deposit of the MC D phase, i. e. the latest MC phase. This is mainly detected in secondary deposits throughout the town, such as the one under discussion here,[188] and corresponds to the later part of the Cretan MM III period.[189] The date of the layer, which includes earlier remains used to level the rocky terrain, could even represent a rough date for the construction of this part of the building in general. The seal and associated finds are discards from earlier — and wholly unknown — circumstances. The monochrome painted decoration on stucco fragments retrieved together with the seal suggests that the

182 For the public sewage system in general: Palyvou 2005, 41–42.

183 Sofianou – Georma forthcoming.

184 The conservation of pottery revealed more than 80 cups (conical and Cycladic), along a considerable number of other vessels: jugs, a fruit-stand (with organic residues), a miniature fruit-stand, an amphora (in use, with imprints of a legume inside), a three-handled pithamphora, a brazier, rhyta, a big open vessel, nippled ewers.

185 *Praktika* 1999, pl. 98b.

186 *Praktika* 1999, pl. 98c.

187 *CMS* V Suppl. 3 no. 387: 'MK III Keramik'.

188 Nikolakopoulou *et al.* 2008, 319.

189 Knappett – Nikolakopoulou 2008, 3.

Figs. 26, 27. NPP 44A: pottery from Layer VI where *Petschaft* **S15** was found (Akrotiri Excavations Archives, photos by C. Papanikolopoulos – D. Sakatzis).

earlier remains cannot be pushed further back than the end of the MC period.[190] The date provided by the clay drain pipe further suggests that the seal must have found its way into the floor's substratum sometime during the early LC I period, although its context represents the earlier MC D ceramic phase.

190 See Televantou 1994, 357–61, where earlier wall paintings found either in debris or embedded in later wall paintings from various locations in the settlement are seen as a result of an extensive destruction, which could be the SDL; renovations and rebuilding activities that followed included the installation of clay pipes within walls, such as the one attested in the West House.

Seal S16: 'Première maison d'Acrotiri'

A little known fact about Akrotiri is that the ancient site was investigated for the first time in 1867. A French geologist, F. Fouqué, ventured to Thera at the time, in order to observe a volcanic eruption close up. He took this opportunity to briefly investigate the stratigraphy formed by older explosions and detected stone walls, which he thought must postdate an ancient, but as yet undated eruption. Some three years later, in 1870, two of the first members of the French School at Athens, the geologist H. Gorceix and the geographer H. Mamet, followed his steps and investigated a limited number of trial trenches on Thera. Two of the trenches were in what we know today to be the ancient settlement of Akrotiri, one more lay to the N of the modern village of Akrotiri in the locality 'Balos'; they also investigated a trench in the neighbouring island of Therasia. All their trenches produced ancient, pre-eruption habitation evidence; some finds from those brief investigations were transported to the School's facilities in Athens, where they are still housed today.[191] The excavators reported their activities in short, preliminary accounts,[192] but never in any detail. All testimonies of their investigations were thought lost from the archives of the School, and interest in the old excavations slowly waned.[193] A century later, Marinatos picked up from where the first excavators had left off.[194]

The most extensive account of Gorceix and Mamet's investigation appeared in a book on the volcanic history of Thera by Fouqué.[195] At one point he describes an object found in the Gorceix-Mamet excavations, which is most clearly a seal: 'un disque en serpentine de 13 millimètres de diamètre. Ce disque, percé d'un trou circulaire sur sa tranche porte sur l'une de ses faces plusieurs entailles régulièrement disposées; autour du trou, la matière ne presente aucune usure, ce qui aurait eu lieu s'il eût été enfilé avec d'autres de manière à former un collier; c'était un pendant d'oreille ou une amulette à porter au cou.'[196] Two drawings of this seal, which was not illustrated in Fouqué's book and is not listed anywhere among the objects housed at the French School at Athens, have recently resurfaced and allow us to include a more accurate account of this find here. A brief note indicated that part of the original Gorceix–Mamet report to the overseeing committee in Paris, probably written during or immediately after the excavation, is housed at the *Institut de France* in Paris.[197] In addition, some photographs, as well as colour aquarelle drawings executed by the then director of the French School, É. Burnouf, were found in his personal archive, which was donated by his heirs to the Law Library of the University of Lorraine at Nancy.[198] Both these archives contain a drawing of the seal.

191 Renaudin 1922; Maffre 1972.

192 Mamet – Gorceix 1870; Gorceix – Mamet 1870.

193 Tzachili 2005; 2006.

194 *Thera* I, 6.

195 The account in Fouqué 1879, 94–131, pls. XXXIX–XLIV.

196 Fouqué 1879, 112.

197 Amandry 1975, 334, n. 2: 'archives de l'Institut, cote 14G'. I owe the information and copies of the archive's contents to the generosity of F. Rougemont, P. Darcque and A. Boucher, to whom I am extremely grateful.

198 *Calames*, Nancy. BU Droit, Manuscrits d'Émile Burnouf no. 45. After accessing Burnoufs documents online, I subsequently visited the Nancy library in September 2010, owing to the kind intervention of the late P. Carlier, and personally examined Burnouf's archive (Karnava 2014a; 2014b).

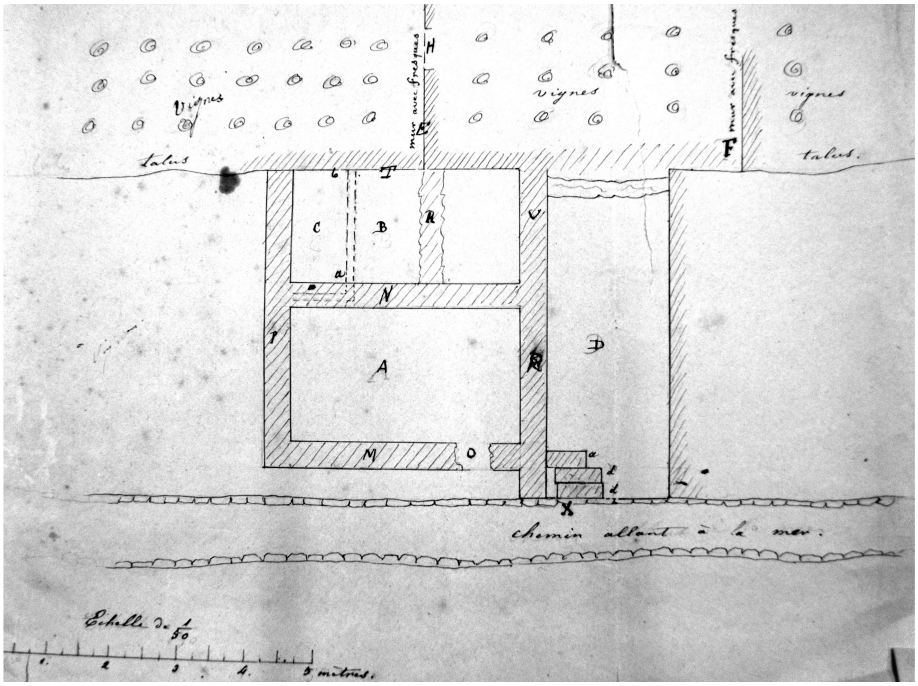


Fig. 28. 'Première maison d'Acrotiri' (sketch by H. Gorceix [?], *Mémoire de MM. Gorceix et Mamet © bpk-RMN-Grand Palais/Anaïs Boucher/Paris, Académie des Inscriptions et Belles Lettres*; a version of this plan appears in Fouqué 1879, 109).

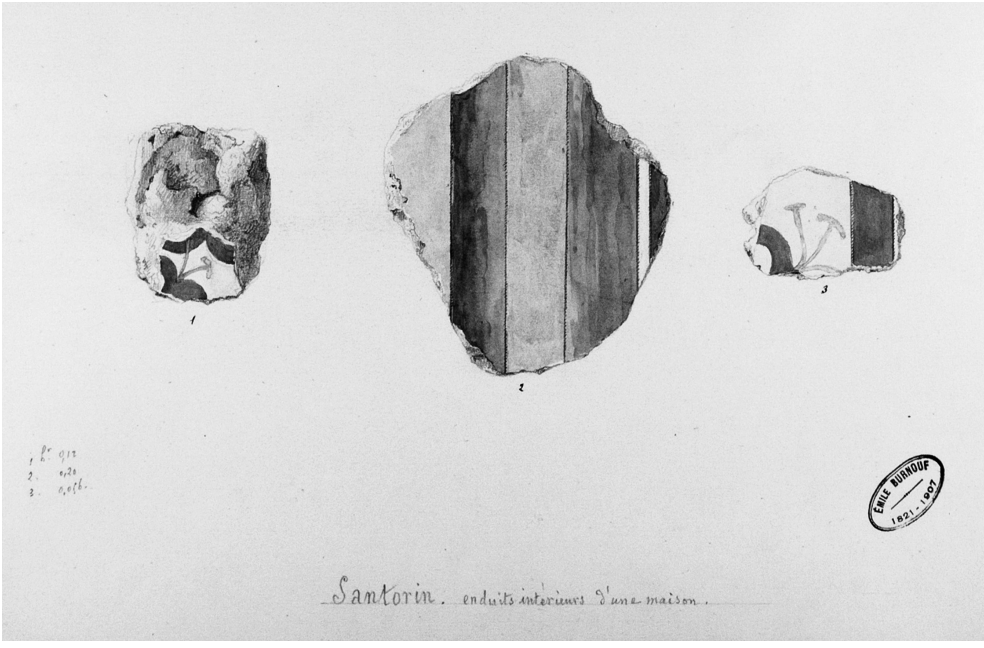


Fig. 29. Wall painting fragments from the 'première maison d'Acrotiri' where seal **S16** was reportedly found (*Manuscrits de l'université de Nancy/UL, Manuscrits d'Emile Burnouf, Burnouf 45, Direction de la Documentation de l'Université de Lorraine/BU droit*; Furtwängler – Löschcke 1886, 19 nos. 73, 74, pl. XII 73–74).

The seal is reported as found in the so-called First House of Akrotiri, i. e. in the building detected in the first trench the French opened at Akrotiri. The exact locations of the old trenches have not been identified in today's settlement, but some approximation is possible. Fouqué describes this first house quite carefully, so some important details about it are known (*Fig. 28*). The most important element he discusses is the fact that the building contained two different spaces with wall paintings, one of which was a corridor (E) and the other a large room (F) (indicated in the plan below). The fragments reportedly found depicted alternating bands of yellow, black, blue and white colours, as well as lilies with red leaves and yellow stamens near a red band, all coming from the same composition (*Fig. 29*). Comparison of these fragments with the wall paintings discovered and recorded at Akrotiri to date yields no matches;[199] thus the building investigated by the French mission has not yet been securely detected.

There is in fact a location in the settlement where wall paintings with lilies have been reported, but not excavated. In the area to the S of Sector Alpha (A), briefly investigated in 1968 and not further explored due to the danger of pumice collapse, Marinatos identified two rooms with wall paintings: the 'Porter's Lodge' and the 'Kitchen'.[200] Both belong to the building later named 'Building Eta (H)', which was not excavated. The 'Porter's Lodge' produced wall paintings coming from the upper storey of the building, with themes involving blue birds and blue monkeys, as well as the 'African', a male head in a tropical setting.[201] The 'Kitchen', on the other hand, is supposed to have produced wall paintings with papyri and lilies, but no fragments were collected; the wall paintings were given first-aid and their trench was back-filled. Building Eta (H) could, therefore, be the building that the French excavators traced, a suspicion to be confirmed or discredited by future excavations in the area.

Commentary: The excavators describe the now lost seal **S16** as a disc made of 'serpentine' engraved on one side. Knowing that Gorceix was a geologist, we can assume that his identification of the material is accurate. The style, shape and characteristics of the seal suggest a Neopalatial date and a Cretan origin for the piece. Since the seal was found in a LC building, the context date does not contradict the stylistic date for it.

THE SHAPES: FROM PENDANT SEALS TO LENTOIDS

The small number of seals retrieved at Akrotiri presents us with an interesting, yet limited array of shapes. The reason for this restricted variety is probably the fact that most come from LC I layers and are Cretan imports, thus extreme variations in shapes and sizes are not to be expected. Cretan Neopalatial seals show a certain standardization in shape — at least in comparison to Prepalatial and Protopalatial output — with lentoids, amygdaloids and cushions predominating.[202] At Akrotiri only lentoids and amygdaloids are attested so far.

199 I thank F. Georma for sharing her assessment of the situation with me.
200 *Thera* II, 27–30, pls. 27, 28.2, 30.1; V, 15–16, pls. 13, 14a–b.
201 Doumas 1992, 184–87, 'Area of Sector A', 'Area of the House of the Ladies', pls. 147, 148; Vlachopoulos 2007.
202 Krzyszkowska 2005a, 124.

Among the Akrotiri seals a considerable proportion, namely six out of 16, are lentoids: **S1**, **S2**, **S6**, **S9**, **S11**, **S12**, and potentially also **S16**;[203] by contrast only a single amygdaloid, **S4**, is found. Other shapes attested are the irregular discoid **S5**; the *Petschaft* **S15**; the disc without a suspension hole **S7**; the disc with a suspension hole **S14**; the three pendant vertical plates **S3**, **S8**, **S10**; and the stamp seal **S13**.[204] The shapes other than lentoids may be explained in part, because they come from contexts older than the LC I layers and consequently represent earlier phases in Minoan glyptic. However, the LC I layers have not only yielded 'mainstream' Cretan seal shapes but also some unusual shapes.[205] Explanation for the presence of these shapes in LC I layers should perhaps be sought elsewhere.

The majority of seals found at Akrotiri conform to shapes known from Cretan glyptic production. Hence there is no good reason to dispute their Cretan origin, at least not in terms of their shape or decoration. The few local products, established as such by the materials from which they are made, also deviate from Cretan norms with respect to shape.

A Pendant Vertical Plate

The straight-sided soft stone pendant seal **S3** (*Fig. 30*)[206] is an essentially Prepalatial seal shape.[207] The body of pendant seals is furnished with a suspension hole on its upper part, which is not set off from the rest of the seal.[208]

Examples which are directly comparable in shape and decoration to **S3** come from various locations in Crete and were mostly recovered from communal tholos tombs in Moni Odigitria, Siva and Plati in Lasithi,[209] although one was also found at Kolonna in Aegina;[210] none of these parallels has a context dating narrower than 'Prepalatial'. The Akrotiri specimen is the only example of such a seal from a closely-dated context: MC A, which, based on suggested correlations between Akrotiri and Cretan chronologies, corresponds to MM IA.[211] On stylistic grounds the comparanda may be dated between EM II and MM IA;[212] this suggests that the Akrotiri seal could even be an earlier product found in a later context.

It is noteworthy that a pendant with the exact same shape and dimensions similar to those of the Akrotiri example has been found in the Lebena Tholos II,[213] where numerous

203 The exact shape of this seal is unknown, since it is lost; the possibilities vary between lentoid, discoid and disc.

204 The terminology follows Yule 1981, 24–117; Sbonias 1995, 38–72.

205 The discoid **S5**, the disc **S14** and the pendant vertical plate **S10** also come from such contexts.

206 In the *CMS* terminology: *Anhänger Vertikalscheibe*, with the English translation being 'pendant vertical plate'.

207 Yule 1981: this seal would fall between the category of 'pyramids' (Class 23: p. 69) and 'rectangular plates' made of soft stone (Class 26b: p. 73). In a later study it is suggested that hard stone *Pyramidoide* are attested during EM II (Sbonias 1995, 40 no. 1d), and soft stone *rechteckige Plättchen* remain a separate type (Sbonias 1995, 61 no. 56).

208 *CMS* III, p. 25; a number of variant shapes occur under the generic term 'pendants', of which *Vertikalscheibe* is one.

209 Moni Odigitria (bone and hippopotamus ivory respectively): *CMS* V Suppl. 1A nos. 231, 247; Siva (bone): *CMS* X no. 6; Plati (steatite): *CMS* V Suppl. 1A nos. 62, 63.

210 *CMS* V Suppl. 3 no. 1 (steatite), a stray find.

211 Nikolakopoulou *et al.* 2008, 313–17.

212 Information from *CMS Seal Database*; this information is not included in the printed *CMS* volumes.

213 'Flat rectangular plaque perforated at top', H. 3.32 cm, W. 1.8 cm, Th. 0.57 cm (Alexiou – Warren 2004, 128, fig. 35, pl. 113D, no. 523; a broad chronological estimate of EM II–MM I is given).

Fig. 30. Pendant vertical plate **S3**, *Petschaft* **S15**, discoid **S5**, amygdaloid **S4**; scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

seals with cross-hatching decoration have also been recovered. The Lebena pendant has no engraved decoration, but it is termed by the excavators an 'amulet' because it has a suspension hole.

There is no reason to assign a Cretan origin to this particular shape; as indicated above, its origin lies within third millennium BC glyptic. For this period no main production 'hub' has been identified in the Aegean world, unlike the second millennium BC, when Minoan Crete played an important role in the production and diffusion of seals in the Aegean.[214]

A Discoid

The soft stone seal **S5** is best seen as a discoid, even though it displays some features atypical for this shape class, which comprises seals with round convex seal faces (*Fig. 30*). By contrast the periphery of the Akrotiri seal is nearly oval and one of its faces is flat. However, it fits well with other discoids in terms of material and decoration.[215]

214 Krzyszkowska 2005a, 36–37.

215 Yule 1981, 50–51. The author states that all the then-known examples were considered, although a few were later than MM IIIB.

The Akrotiri specimen with dimensions 1.4 × 0.65 cm appears somewhat smaller than the average discoid, which is 1.5 × 0.7 cm, yet presents us with both the centred-circles ornament and the hatching and cross-hatching, which are decorative themes also encountered on other soft stone discoids.[216] Ornamental designs in general are most popular for this seal shape, but animal motifs, either full-body representations or heads, are also attested.[217] Discoids are chiefly produced in the MM II and MM III periods, but some are thought to have been made earlier on account of their decorative motifs.[218] At the other end of their life-span, some are still produced at the transition from MM III to LM I. This is true of the amethyst discoid bearing a bearded male head, which famously derives from Grave Circle B at Mycenae and is seen as a LM I product.[219]

A *Petschaft*

Seal **S15** is a *Petschaft* with a convex seal face made of a medium hard stone (*Fig. 30*). The term *Petschaft*, which translates from German as signet, refers to Cretan seals 'with a circular base as well as a distinctly articulated midsection and a suspension hole at the top'.[220]

Petschafte date to MM II. Some three-quarters of the 82 surviving examples of *Petschafte* have a flat seal face, yet a minority, to which the Akrotiri example belongs, have convex faces. Convex seal faces appear to be the rule among seals in general from the Neopalatial period onwards, but as demonstrated by material from Protopalatial Phaistos, which includes a significant number of impressions from convex faces, they are not a decisive chronological criterion.

Petschafte have, at times, elaborate handles with grooves and ribs of varying depths and profiles. The Akrotiri example has a rather simple suspension handle, but a minimum of elaboration is still discernible, although with difficulty due to the surface erosion caused by adverse taphonomic conditions at Akrotiri. In fact, its handle shape is so simple, that this *Petschaft* exceptionally does not have a distinctly articulated midsection; this simplicity has no parallels among the surviving *Petschafte* from Crete.[221]

An Amygdaloid

The amygdaloid **S4** is remarkable because of its material and size (*Fig. 30*). It is made of hard stone, like the overwhelming majority of Cretan amygdaloids, but its specific material, namely smoky quartz, is quite rare among Cretan products.[222] It measures 2.1 cm, which makes it a rather large example of its kind.[223] These elements, together with its precisely executed motif, make it somewhat exceptional.

216 *CMS* II,2 no. 51; III nos. 116, 137; V Suppl. 3 no. 146; VII no. 25.

217 Some full-body animal representations: *CMS* VI nos. 153, 154; VIII no. 47; and some animal heads on discoids: *CMS* II,2 nos. 36, 48, 213; VIII no. 115.

218 *CMS* II,1 no. 302; V Suppl. 1A no. 217; VI no. 13; X no. 40.

219 *CMS* I no. 5; Krzyszkowska (2005a, 137) dates it to MM III–LM I.

220 Yule 1981, 85–88.

221 It is probably for this reason that **S15** is called a 'Griffösensiegel Horizontalscheibe' ('pierce-grip seal horizontal plate') in the *CMS Seal Database*, and is not listed under *Petschafte*.

222 Krzyszkowska 2005a, 82.

223 Krzyszkowska 2005a, 126.

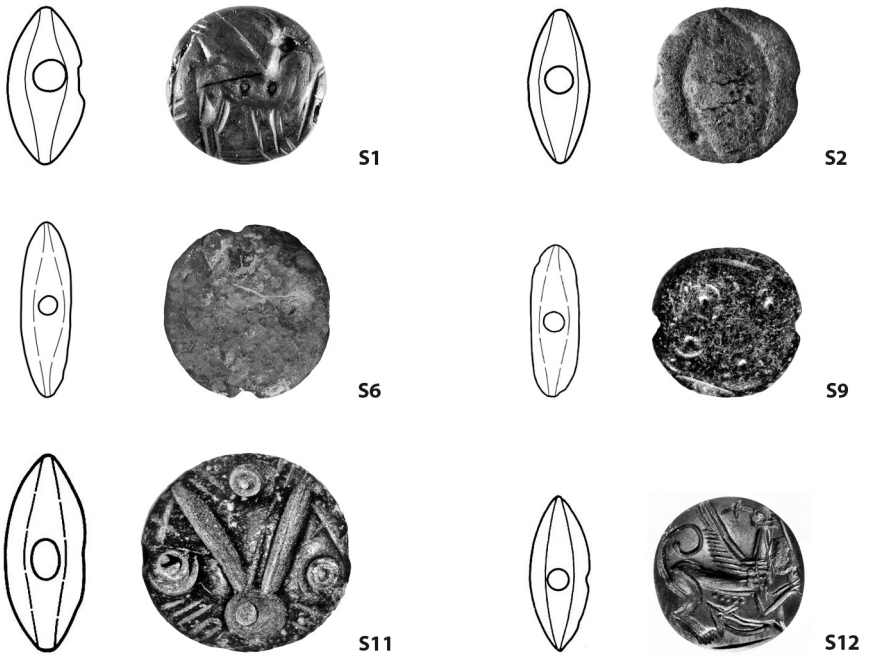


Fig. 31. Akrotiri lentoids, faces and sections; scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

The production of hard stone amygdaloids accompanies the transition to MM III and the glyptic of the Neopalatial period. Amygdaloids are among the most popular shapes in the LBA counting more than 1000 surviving specimens among Aegean seals in general. Based on its context dating to MC C, **S4** can be dated to the beginning of the MM III period, which is the period when the first amygdaloids were produced. Amygdaloids were also popular with the 'talismanic' decorative style in the Neopalatial period, a tendency to which this seal conforms.

The Lentoids

All six lentoids come from datable LC I, early and late, contexts. The high proportion of lentoids conforms to the fact that lentoids became the dominant shape in the Neopalatial period.[224] Lentoids were apparently first produced around the MM II–III transition, but they are considered typical of the LBA seal output.[225] As is common with lentoids, all Akrotiri lentoids carry engraved motifs on a single face (*Fig. 31*). Lentoids could be worn on the wrist, as the well-known Cup Bearer Fresco from the Knossos palace demonstrates,[226] hence there was no need for the second face to be decorated.[227] Three of the Akrotiri lent-

224 Yule 1981, 63–64, following Younger 1973, 19–21 (*non vidi*).

225 Yule 1981, 63–64: Class 19, Lentoids.

226 Evans 1899–1900, 15: 'an agate lentoid — the bands of the stone being clearly indicated — on his left wrist'; Evans 1928a, pl. XII.

227 The fact that more than one side bore incised motifs on Protopalatial seals does not mean that they were not meant to be worn.

oids have engraved faces so worn that the motifs on **S2** and **S9** are hardly discernible, if at all, as is the case of **S6**. It is hard to be certain if the excessive wear is due to poor quality materials — perhaps aided by potentially adverse taphonomic conditions[228] — or if it should be attributed to intense use. The overall bad state of preservation of **S9** could support the former; the good state of preservation of the undecorated face of **S6**, the latter.

The average diameter and thickness of the Akrotiri lentoids is 1.5 cm and 0.48 cm respectively. Most have a diameter of 1.4 cm that is close to the average for soft and hard stone lentoids,[229] but **S11** possesses a diameter of 1.75 cm. Two of the lentoids, **S1** and **S12**, are made of red jasper, another two, **S9** and **S11**, are of green serpentine, and two more are inderterminate soft stones: **S2** has an orange-brown colour, **S6** is reddish brown. The jasper lentoids differ somewhat in their red hue (**S1**: red-orange; **S12**: brown-red); it is noteworthy that the two soft stone lentoids that defy precise recognition of their material are also variants of red.[230] The serpentine examples, although seemingly made of similar material, are very different in terms of size and shape: **S9** is the smallest of the lentoids (Ø 1.35 cm), **S11** is the largest (Ø 1.75 cm).

The small lentoid **S9** is the sole example that has plano-convex faces, whereas the other lentoids all have convex surfaces (of varying degrees of convexity).[231] In this respect, **S9** fits better under a hybrid shape of seal that wavers between discoids, essentially a Protopalatial seal shape, and lentoids, a Neopalatial seal shape, and has therefore been dubbed here a 'disc-shaped lentoid'.[232] Examples belonging to this subclass seem to have a smaller diameter than lentoids, as does **S9**. Thus, on account of its discoid character, one cannot exclude a somewhat earlier date for **S9**, namely around the beginning of lentoid production. The fact that the seal is badly abraded, hence the motif is barely preserved, and the suspension hole is considerably enlarged, probably as a result of wear caused by the suspension string, could support an early dating for this piece.

A Disc

The soft stone disc[233] **S14** belongs to a shape class that starts as early as EM II and is found throughout the Minoan period; it reportedly has 'the longest continuous lifespan of any of the Minoan shapes',[234] which means that this simple shape was often produced and copied.

This particular piece differs from other discs in that its contour resembles that of a so-called figure-of-eight shield, created deliberately and not through wear (*Fig. 32*). In Minoan

228 It should be kept in mind that taphonomic conditions at Akrotiri are not uniform throughout the settlement, but, most importantly, they can by no means be compared to those on any other archaeological site in the Aegean.

229 Yule 1981, 63–64; Krzyszkowska 2005a, 126.

230 For an overview of the importance and special meaning of the red colour in the Aegean Bronze Age societies, see Blakolmer 2013. For the potentially sacral meaning of red in the context of Akrotiri, see Boulotis 2005, 73.

231 This reflects a general trend in Neopalatial glyptic (Krzyszkowska 2005a, 124).

232 The term is suggested by Pini (pers. comm.). Yule (1981, 52–53: Class 11c, Lenticular Discoids) termed this type of seals lenticular discoids, but the Akrotiri example is nearer to lentoids than discoids.

233 Pini would also class it under 'disc-shaped lentoids' like **S9** (pers. comm.). Its profile, however, is decidedly different than the profile of **S9** and is by no means reminiscent of lentoids.

234 Yule 1981, 48.

Fig. 32. Disc **S14** faces and sections; scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

and Mycenaean archaeology the figure-of-eight shield is a familiar image in wall paintings and seal iconography, and is widely considered as being imbued with ritual symbolism,[235] although its exact interpretation is debated.[236] The shape of a figure-of-eight shield as an iconographical *topos* (pattern) is not unknown in Akrotiri either,[237] and also makes its appearance among the Xeste 3 vase decoration, from where this seal was retrieved.[238] This resemblance could, however, be fortuitous, since there are no precise parallels for the shape of this disc: the curvilinear contour is not sufficiently pronounced to place it beyond doubt with figure-of-eight-shaped seals, which are few in number and have different forms and chronologies.[239]

It is the lack of parallels that also prevents us from assigning a more narrow production date to this piece. The fact, however, that both sides of the disc appear to have motifs or, at least, traces of them, is a feature that might point to a date within the Protopalatial period, when bifacial seals (i. e. engraved on both faces) were reasonably common. But this observation does not alone guarantee an early date for this piece, since bifacial seals are also attested, albeit more rarely, in the Neopalatial period.

Besides its rare shape, this seal has another rare feature: on the rim of one of its suspension holes, two small circular, almost superficial holes are visible, with diameters ranging from 0.06 to 0.1 cm. This could be evidence for some kind of technical feature, since the regularity of the holes makes it possible that they were executed with a seal engraver's tool.

A Seal with a Round Face

The exact shape of **S16** is unknown since the seal, which was found during the brief investigations of the French at Thera and Therasia in the 19th century,[240] has since gone missing. Two different sketches depict a seal circular in plan that bears a 'talismanic' and/

235 Danielidou 1998.

236 Warren 2000.

237 Boulotis 2005, 49–50, fig. 31; Papagiannopoulou 2008, 433–36, figs. 40.1–40.4; Marthari 2009, 424, figs. 22, 23; Nikolakopoulou 2010, 220; 2011, 260–61, figs 8–9; Marthari forthcoming.

238 Two LM IA three-handled jugs with figure-of-eight shields as their main decorative motif were retrieved from Room 11 of Xeste 3 (Warren 2000, 462, pl. 6). The vases appear to be miniaturistic (Papagiannopoulou 1995, 211, 213, fig. 2; Vlachopoulos 2015, 60).

239 *CMS* II,4 no. 189; V Suppl. 1A no. 219; VII no. 132; XI no. 75.

240 See above, pp. 47–49; Fouqué 1879, 112.

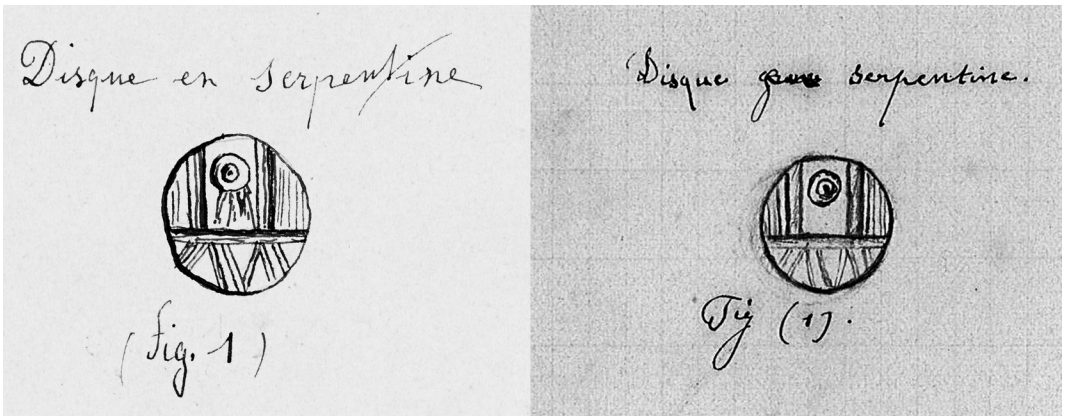


Fig. 33. Seal **S16**: sketches by H. Gorceix (?) (left) and É. Burnouf (right); scale: c. 3:2 (*Mémoire de MM. Gorceix et Mamet © bpk-RMN-Grand Palais/Mathieu Rabeau/Paris, Académie des Inscriptions et Belles Lettres*; *Manuscrits de l'université de Nancy/UL, Emile Burnouf 45*).

or 'tectonic' motif (*Fig. 33*). On the basis of the shape of the seal face and the decoration, it can be conjured that the seal was a lentoid, a discoid or, less probably, a disc. The use of these shapes extends over a long period of time, so they cannot be used as indicators for dating the piece.

A Disc without a Suspension Hole

S7 is an object made of what appears in all probability to be local, volcanic tuff.[241] The piece is designated here as a disc without a suspension hole but this designation is followed by a question mark (*Fig. 34*). The reason for this is that, apart from not having a suspension hole, the piece has one bevelled face, which is engraved, and an undecorated, extremely flat face. It could, therefore, be an object that was fitted onto something and not a seal. Having no parallel, however, either for similar seals or for fittings of any kind at Thera, and because small objects with engraved motifs in intaglio are extremely rare in Akrotiri, it was thought opportune to include it in the present account. The shape of this object finds a parallel among discs of various shapes and materials, such as soft stone, bone and ivory and particularly on one with a bevelled side.[242] In short, this object exhibits a number of traits echoing discs, including its colour, which is whitish with a green hue, but the absence of a suspension hole remains problematic. On account of the absence of convincing parallels, no dating can be suggested for this piece.

Two More Pendant Vertical Plates

The pendant vertical plate with concave-convex sides **S8** does not have an exact parallel among early Cretan seals, inasmuch as it is so thin that it resembles a two-dimensional object rather than the three-dimensional pendants (*Fig. 34*). It is apparently very worn, so

241 *CMS* describes it as 'soft stone?' The local volcanic tuff is indeed very soft.
242 Yule 1981, 49–50; *CMS* V no. 27.

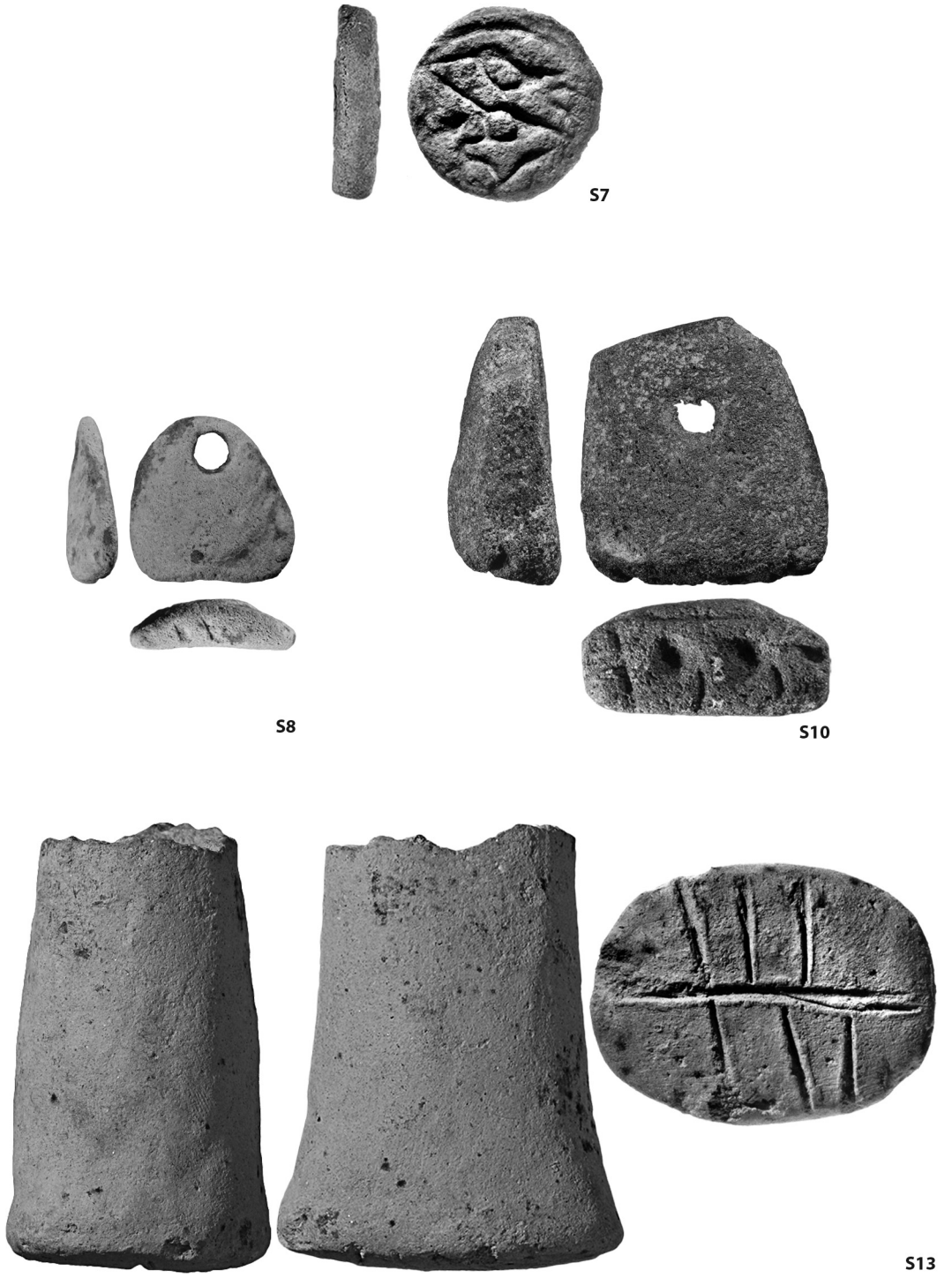


Fig. 34. The locally-produced seals from Akrotiri **S7**, **S8**, **S10** and **S13**; scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

the exact original shape may not be preserved. Prepalatial concave-convex plates made of bone present us with the nearest shape parallels to this example but the peculiar shape and the material of the piece suggest Theran manufacture.[243] Due to its singularity, no suggestion can be made regarding the manufacture date of this piece.

Another pendant vertical plate with plano-convex sides, **S10**, is so named in the absence of a more suitable term in Cretan glyptic (*Fig. 34*). This object has no parallels among Cretan seals, and is beyond doubt also a Theran product. Notwithstanding the absence of parallels for its shape, **S10** qualifies as a seal, since it has a suspension hole and an engraved motif on its lower surface. A parallel for its shape can be found in large-sized Minoan stone anchors, also thought to have served as votive objects.[244] On the other hand, the 'anchors', i. e. large pierced stones, found at Akrotiri are somewhat irregular in shape;[245] assuming that **S10** imitated anchors, these are not the ones it imitated. Such ship anchors were found just a few meters away from where **S10** was found: one inside the House of the Anchor[246] and two more in Complex Delta (Δ). The absence of good parallels for this piece makes dating suggestions impossible.

A Stamp Seal

The clay stamp seal **S13** is another rare bird (*Fig. 34*). Clay seals are rare in the Aegean after the third millennium BC.[247] If one assumes that **S13** was meant as a seal, two categories of Cretan seals might have served as prototypes. The first are the so-called bell-shaped conoids, a shape that appears in the Cretan late Prepalatial/early Protopalatial period (MM IA–IB).[248] Stamp cylinders with concave sides constitute a second possibility; this is a shape that flourished in the late Prepalatial period, with most surviving examples made of ivory.[249]

Besides its unusual shape by second millennium BC standards, the oval seal face of this piece is also exceptional. The few clay seals with oval faces known from the Aegean date to the Neolithic and EBA periods. The only exception is a clay conoid with an oval-shaped face from a LM I house in Gournia. However, the figurative motif on this seal is no match for the simple design comprising irregular intersecting lines attested on **S13**.[250] Since this seal shape is attested in Crete until the early Protopalatial period, and the only Cretan specimen of later date appears to subscribe to the complex iconography of the Neopalatial period unlike our Akrotiri specimen, no date can be suggested here for this piece on the basis of typology.

243 Yule 1981, 38–39.
244 Davaras 1980; Detournay *et al.* 1980, 235–38.
245 *Thera* VII, 12, pl. 10.
246 *Thera* VI, 19, pl. 29.
247 *CMS* lists 144 examples, but most of them derive from Neolithic and EBA levels.
248 Yule 1981, 41–42.
249 Yule 1981, 90.
250 *CMS* II,1 no. 464.

THE MATERIALS: CLAY AND STONE

Most seals found in Akrotiri so far were in all likelihood imported. We may deduce this with a degree of confidence on the basis of their technical and stylistic traits, which are clearly Cretan, and their materials, which are known not to have been locally available. Only a few pieces are made of local materials and must have therefore been of local origin and manufacture: **S13**, which is made of Theran clay; **S10**, cut from a hard porous volcanic stone; and **S7**, **S8**, both probably made of soft, volcanic tuff.[251] The difficulty in finding parallels for these seals among Cretan seal output accords with the observation that they represent local, Theran production.

Clay

All seals found at Akrotiri are made of stone, except for **S13**, which is made of local clay. Clay seals, as already noted previously,[252] are a rarity in the Cretan and Helladic seal production by the second millennium BC. The conoidal shape is the most frequently attested among clay seals of the third millennium BC and the Akrotiri specimen, although it is missing its upper part, does not seem to diverge significantly from this norm. Clay was easy to manipulate in terms of producing a particular seal shape, but, generally speaking, only simple geometric patterns were executed on the faces of Aegean clay seals.[253]

The use of clay for the manufacture of seals represents an earlier trend, most probably Helladic, but also Balkanic and Anatolian, as opposed to a Cretan one,[254] since clay was frequently used for the manufacture of seals in these areas during the Neolithic and EBA periods. The earliest examples of clay seals date to the mid-seventh millennium BC, with the Neolithic *pintaderas* being the most prominent specimens of such seals. It was, however, the third millennium that saw a more standardized and abundant production of seals in clay.[255]

Stone

The overall numbers show a preponderance of soft stones among the Akrotiri seals, with nine specimens made of steatite/serpentine, tuff, and two further unspecified soft stones. One specimen is made of a calcareous stone, which may be classified as medium-hard, and five specimens are made of hard stones, such as jasper, smoky quartz and a porous volcanic rock.

However, if we divide the seals chronologically, the picture becomes more nuanced. The earliest seal, **S3**, is made of soft stone, namely steatite. Among the other three MC seals we find **S5** made of steatite, **S15** of a calcareous stone (probably marble), which is a medium-hard stone, and **S4** made of smoky quartz, which is a hard stone. By contrast, among the 11

251 Einfalt 1978, 524.

252 See above, p. 58.

253 Pini 1984, 73. A clay stamp-cylinder from Agios Onoufrios depicts, however, a human figure (*CMS* II,1 no. 105b). See above, p. 58, for more parallels, and below, p. 72, for the motif of this particular seal.

254 Younger 1991, 45–46.

255 Krzyszkowska 2005a, 24–25; Aruz 2008, 11–12 (on Neolithic seals in the Aegean), 18–19, 32 (on EBA II seals in the Aegean), 34–36 (on EBA seals in the Cyclades).

seals retrieved from the LC layers **S1** and **S12** are made of jasper, **S10** of a porous volcanic material and the remaining eight of soft materials: **S9**, **S11**, **S16**, serpentine; **S14**, steatite; **S2**, **S6**, unspecified soft stones; **S7**, volcanic tuff; **S8**, volcanic tuff/marble. Since locally-procured volcanic materials enter the equation at Akrotiri, we cannot assume that hard stones necessarily yielded more intricate seals. Indeed, the local pendant vertical plate **S10** is an unrefined and coarse object, and the hardness of the material may well have prevented a more sophisticated result.

As far as soft stones, which fall under grades 1–4 in the Mohs scale, are concerned, three seals are identified as steatite (**S3**: black; **S5**: brownish-yellow; **S14**: black), and three more qualify as serpentine (**S9**: dark green-black; **S11**: dark green-grey; **S16**: unknown colour). Yule claimed that the distinction between steatite and serpentine is impossible based on visual examination;[256] but more recently Krzyszkowska described steatite as having a slightly 'soapy' feel (Mohs 2–3) and serpentine as being 'of greenish hue, sometimes with variegated effects (i. e. like a serpent or lizard)' (Mohs 2–4).[257] These characteristics are to be found in the seals mentioned above.

The single calcareous seal attested, the whitish *Petschaft* **S15**, if of marble, should have a hardness of Mohs 4–6. As far as hard stone seals are concerned, **S1** and **S12** are made of jasper, and **S4** is made of smoky quartz, both exhibiting a hardness of Mohs 6.5–7. Smoky quartz is additionally interesting, because it was a rare material. Yule originally counted only three examples of smoky quartz among early Cretan seals,[258] and certain other varieties of coloured quartz, e. g. rose quartz, are also rare.[259] These rare quartzes were occasionally used in the Protopalatial period,[260] while others bear 'talismanic' motifs dating to the MM III–LM I period.[261] Since 'talismanic' decoration, in a sense, continues Protopalatial hard stone seal production,[262] it is no wonder that quartz should be attested in both instances.

Notes on the Seals of Local Manufacture

Four seals can be seen as representative of local manufacture. **S13** is termed as local because it is made of yellowish clay, characteristic of the Theran pottery production. **S10** is another instance of a seal that is listed under local products with certainty, because it is made of a porous black volcanic stone, frequently seen among building materials in the ancient settlement. **S7** is made of another frequently attested building material, a whitish-green tuff, also a volcanic material. **S8** is a dubious instance of the local volcanic tuff.

S13 and **S7** were apparently not produced with difficulty, since clay, on one hand, and the extremely soft tuff, on the other, do not require special tools or highly skilled craftsmen

256 Yule 1981, 198.

257 Krzyszkowska 2005a, 357.

258 Yule 1981, 197 listed: *CMS* II,2 no. 56; III no. 21 (Yule: CM 159); X no. 246. *CMS* III no. 21, however, is opaque and beige to reddish-white in colour, whereas smoky quartz is translucent with a greyish cast.

259 Note that the term 'quartz' is here used exclusively for these rare, coloured varieties. In reality the more familiar rock crystal and amethyst are forms of macro-crystalline quartz; while jaspers, chalcedonies, carnelians and agates are varieties of micro-crystalline quartz: Krzyszkowska 2005a, 82.

260 *CMS* III no. 238; X no. 280.

261 *CMS* II,3 no. 1; III no. 143; V no. 238; IX no. 97; XII nos. 147, 171.

262 Onassoglou 1985, 187–89.

for their manufacture. The ease with which these raw materials could be handled did not prompt the execution of intricate motifs, since these two seals exhibit rather simple incised motifs.

THE ICONOGRAPHY: MINOAN *VS.* CYCLADIC

Seal iconography is a fundamental aspect in the study of Aegean glyptic. Although the seals found at Akrotiri do not appear as a homogeneous set of evidence, the motifs attested on them merit attention. The circumstances under which local seals were produced remain unknown and the same applies to the mechanisms through which imported ones came to Akrotiri. Consequently, we cannot be certain if they represent the aesthetic perceptions of their proprietors with any accuracy. It is, however, essential to assess the potential significance of their iconography not only in local terms, but also within the broader Minoan context.

Motifs on Imported Seals

CROSS-HATCHING

The soft stone EBA pendant vertical plate **S3** carries cross-hatching (*Fig. 35*). The decoration, which is a Prepalatial favourite,[263] fits well with the date attributed to the seal shape. Cross-hatching is attested on numerous Cretan seals of soft stone, bone and ivory, which date mostly to EM II and are encountered from the Mesara to eastern Crete.[264] Two steatite examples originate in Lebena Tholos II,[265] one comes from the settlement at Myrtos;[266] these are among the earliest sites on Crete to have yielded seals, the very first to have been made and used on the island.[267]

Using material from Moni Odigitria as a frame of reference, Sbonias has given a broad picture of Prepalatial seal use and distribution in Crete. He suggests that seal production shows signs of specialization and discernible regional traditions, which co-exist with more general trends. In addition, he considers that seal production cannot be seen as limited to the domestic level, but the catchment area is probably 'the region at the kinship group level'.[268] In this respect — and moving beyond the narrow Cretan environment — it is noteworthy that seals which fit these traditions are found at localities outside Crete, namely Thera as well as Aegina. As already noted, a pendant of a shape comparable to the Akrotiri specimen was retrieved in Kolonna, Aegina,[269] but also a pyramidoid with cross-hatching was recovered as a stray find from the site of the later Aphaia temple in Aegina.[270]

263 Yule 1981, 147.
264 Sbonias 2010, 221.
265 Two examples in steatite: *CMS* II,1 no. 195 (Alexiou – Warren 2004, 136, no. 533: 'all periods'); *CMS* II,1 no. 199 (Alexiou – Warren 2004, 136, no. 537: context dated to EM I–II).
266 *CMS* V no. 17 (steatite).
267 Krzyszkowska 2005a, 60–61.
268 Sbonias 2010, 222.
269 *CMS* V Suppl. 3 no. 1 (steatite or schist).
270 *CMS* V Suppl. 1A no. 1 (steatite or schist).

The simple, linear motif and its repetition, however, does not necessarily guarantee direct influence from Crete; nor is there any reason to see the motif as an argument in favour of a Cretan origin for this piece. The motif is also attested on stone seals outside the Aegean, namely in western Anatolia;[271] all examples concentrate roughly in the second half of the third millennium BC.

CENTRED-CIRCLES ORNAMENT AND HATCHING

The soft stone discoid **S5** bears both centred-circles ornament and hatching, which are not only the most common decorative themes among MM II–III soft stone discoids, but also among early Cretan seals in general (*Fig. 35*).[272] Yule notes that, based on datable examples of seals with centred-circles, the production of this motif, which he calls 'tubular drill' ornament, falls within MM IB–III,[273] meaning that it is essentially a Protopalatial creation. An exact parallel for the centred-circles motif on the Akrotiri discoid constitutes an early example that dates to EM II–MM IB and comes from Platanos, Tholos Γ.[274] MM III seals from Profitis Ilias, Knossos, provide a lower chronological *terminus* for centred-circles.[275]

A more recent study of Protopalatial soft stone seals has suggested that Protopalatial seals with centred-circles ornament and hatching can be attributed to the so-called Central Crete Ornamental Style Group.[276] The group consists mainly of three-sided prisms, *Petschafte* and discoids; sealings stamped with seals of this style group are well represented in the material from the palace at Phaistos. The production centres for seals of this group are thought to have been located in central Crete, with the main period of production from MM II–III to perhaps as late as MM III–early LM IA.

The motifs on both sides of the Akrotiri seal combined with its shape allow us to assign a MM II date to this piece.

'STAR OF DAVID' MOTIF

The *Petschaft* **S15** bears a simple star motif, of a variety known today as a 'star of David', thus reflecting the popularity of this motif in a culture other than the Minoan (*Fig. 35*). Variations of this simple star created by the combination of two triangles are well represented at Phaistos, chiefly in the sealing deposit that came to light in Room 25 of the early palace,[277] but also on at least one surviving seal.[278] The motif is, basically, a Protopalatial phenomenon,[279] and this observation accords well with the shape of the Akrotiri seal.

271 E. g. a stone conoid with random cross-hatching from Bademağacı (Duru 2008, 172, fig. 344.2a; 173, fig. 345r; Duru – Umurtak 2008, pl. 50g); a bell-shaped conoid from Liman Tepe (Şahoğlu 2008, 489; Şahoğlu – Sotirakopoulou 2011, 291, 379, no. 210; *CMS* V Suppl. 3 no. 457).

272 See above: The Shapes, pp. 51–52; Yule 1981, 143–46.

273 Yule 1981, 50.

274 *CMS* II,1 no. 334, a soft stone *Petschaft*.

275 Yule 1981, 144; *CMS* II,2 nos. 55a–b, 64.

276 Anastasiadou 2010, 67–71; 2011, 148–59; 2016, 167–69.

277 *CMS* II,5 nos. 141–148, 150, 151.

278 *CMS* II,2 no. 23, from the Phaistos palace.

279 Yule 1981, 150.

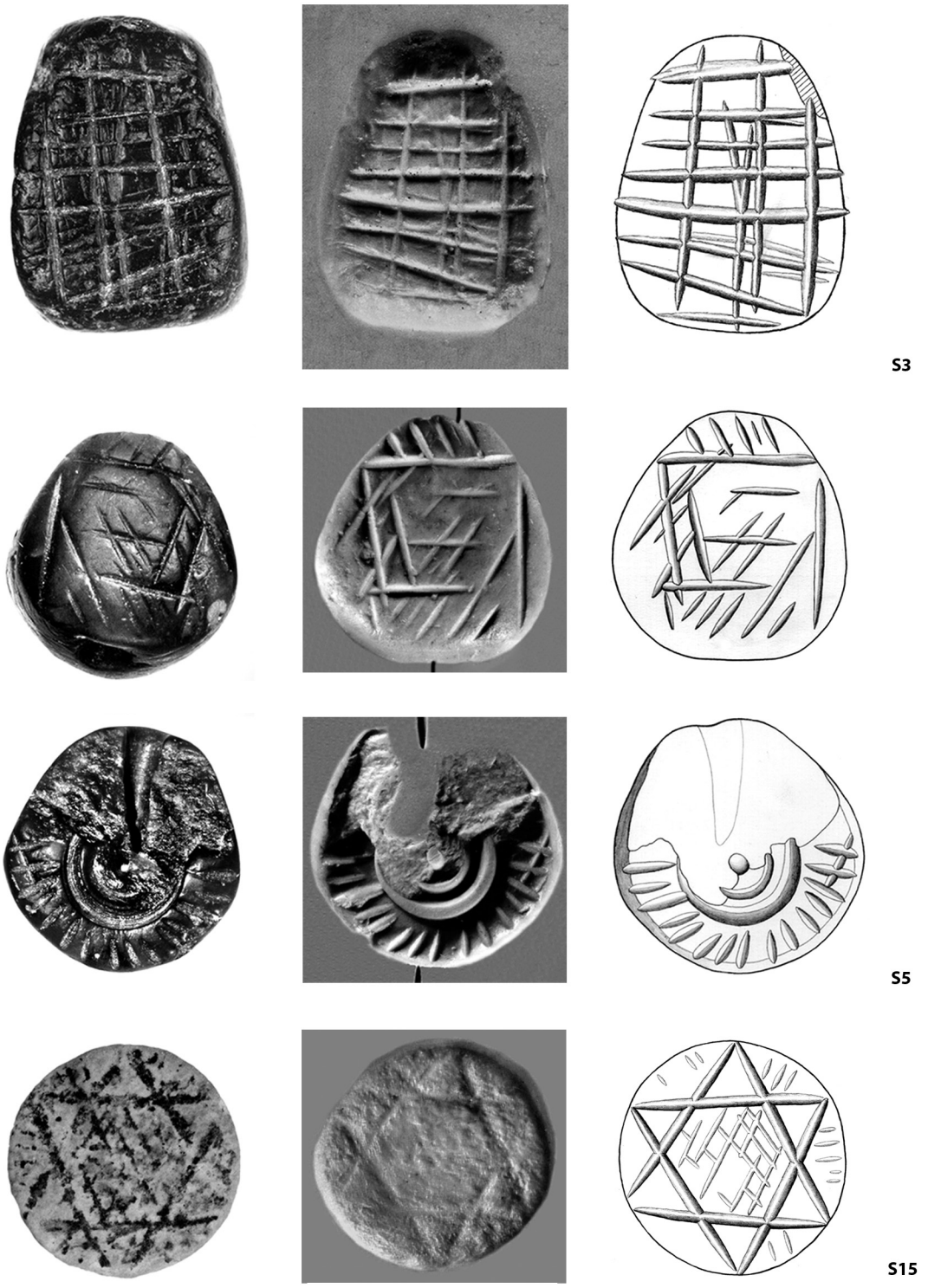


Fig. 35. Cross-hatching on pendant vertical plate **S3**, centred-circles and hatching on discoid **S5**, 'star of David' on *Petschaft* **S15** (Akrotiri Excavations Archives/*CMS* Archive).

Although the principal engraved motif is the star, cross-hatching was used as background filling, another characteristic of the Phaistos seal impressions. The regular cross-hatching, clearly discernible on the photograph of the seal face, is attested only through the preservation of biological residues along what used to be the shallow cross-hatching incisions. While the main star motif is reproduced in the silicone cast, the finer and more superficial cuts for the cross-hatching are not. This may be explained by the worn condition of the seal; volcanic ash seems not to have been friendly to calcareous materials.

In addition to the motif, the Akrotiri *Petschaft* and the Phaistos impressions also accord well in size. At Phaistos a few smaller seal faces have diameters of 0.8–1 cm, while larger ones measure up to 2.4–2.7 cm; the majority have diameters of 1.2–1.5 cm. Thus, with a diameter of 1.25 cm, **S15** fits closely with the comparanda from Phaistos.

FISH ON A NEAR-'TALISMANIC' SEAL

The hard stone amygdaloid **S4**, a seal of fine craftsmanship and striking translucence is close to the 'talismanic' style from the standpoint of motif and technical execution (*Fig. 36*). The fish is rendered by a single cut, a fact which is reminiscent of the 'talismanic' style group.[280] While the inclusion of a fish in this design points toward the 'talismanic' group, the remaining motifs accord with Protopalatial seal production in soft and hard stone alike: the centred-circles ornament (also discussed previously), the thin crossing strokes, the line of small solid borings.[281] The context date of the seal — MC C, which corresponds to MM IIIA in central Cretan terms — agrees with these observations regarding the motif. In other words, the seal features a number of favourite Protopalatial motifs, but points forward to the 'talismanic' style which evolves fully in later periods (MM III–LM I).[282]

'TALISMANIC' GOAT, FISH, SPRAY

Out of the six Akrotiri lentoids, **S1**, **S2** and **S11** clearly belong to the 'talismanic' style (*Fig. 36*). The jasper lentoid **S1** bears the motif of a goat, with a spear penetrating its back, flanked by vertical lines and short strokes which are perhaps indicative of vegetal fillers that are common in the 'talismanic' style.[283] The lentoid **S2**, made of a material which looks like jasper but is actually a soft stone, carries two *tête-bêche* (head-to-tail) fish, a motif common in the 'talismanic' style.[284] Although this style occurs principally on seals of hard stone engraved with fast rotary tools, examples in soft stone are not unknown. Unfortunately **S2** is too worn to allow any observations regarding technique. The soft stone lentoid **S11** bears a spray motif, a schematic depiction of vegetal shoots, which are popular in the 'talismanic' style.[285] It is the largest of the Akrotiri lentoids and the motif is cut deeply into the seal face.

280 Yule 1981, 135.

281 The thin crossing strokes appear frequently on Hieroglyphic seals, for instance *CMS* VI no. 40. For solid borings: *CMS* II,2 no. 107, from Malia; *CMS* II,5 no. 288, from the Phaistos palace.

282 The term 'proto-talismanic' seems appropriate for this motif (Krzyszkowska, pers. comm.).

283 Onassoglou 1985, 128–34.

284 Onassoglou 1985, 154–63.

285 Onassoglou 1985, 35–44.

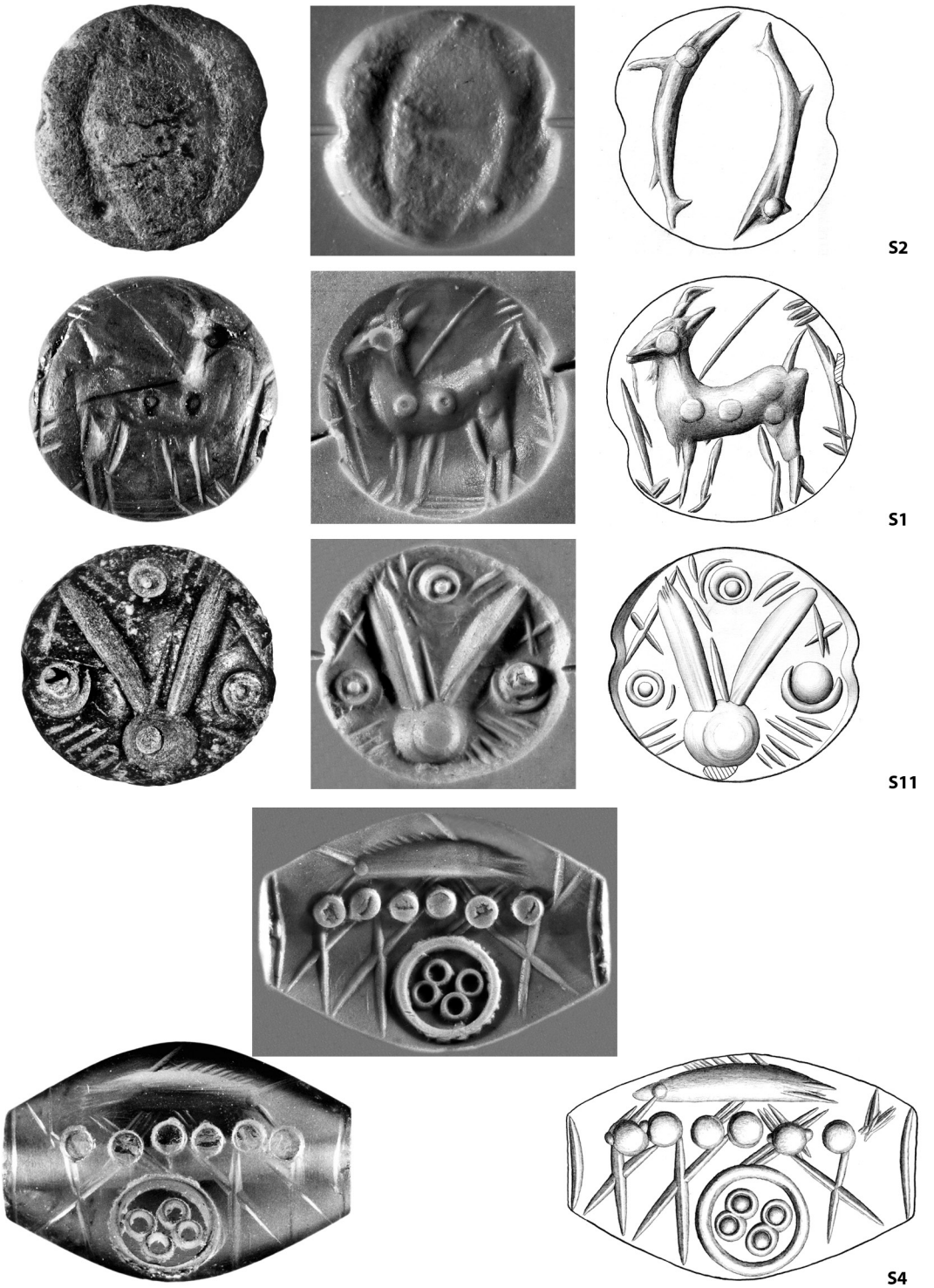


Fig. 36. 'Talismanic' style and affiliates: lentoid **S2**, fish *tête-bêche*; lentoid **S1**, agrimi; lentoid **S11**, spray motif; amygdaloid **S4**, fish (Akrotiri Excavations Archives/*CMS* Archive).

'talismanic' or 'tectonic' ornament with a centred-circle

The seal reportedly found during the very first trial excavations by the French mission at Akrotiri in 1870 is nowhere to be located nowadays. The little information we had on it until recently was limited to its material ('serpentin') and its diameter ('13 millimètres').[286] But certain archival documents regarding those first excavations have now emerged in France, and fortunately two sketches of the seal's face were among them (*Fig. 33*). [287]

For the most part, the two drawings seem to agree, in that both present a round-faced seal with linear engravings and a centred-circle. However, they disagree as to whether a bundle of fine lines runs from the drilled circle towards the centre of the seal face. The drawing that presents this additional detail was in the Paris archive and was drawn by the excavators, Gorceix and Mamet, whereas the drawing lacking this detail was found in Nancy and drawn by Burnouf, the then director of the French School at Athens. It can be suggested that this additional feature is more likely to have existed, rather than a draughtsperson adding something that was not there; on the contrary, it is more plausible to imagine that the second draughtsperson missed out on a detail of the seal.

The sketches present us with an interesting example. The seal face had a deeply cut horizontal *Bandlinie*[288] and two vertical *Bandlinien* above it in an inverted *Π*-shaped combination. In the interior of the *Π* appears a centred-circle. On either side of the vertical *Bandlinien* there is fine parallel hatching; below the horizontal *Bandlinie* four sets of oblique parallel hatching are combined in a zigzag pattern. As mentioned above, some sort of hatching could have extended from the centred-circle with the central boring towards the horizontal *Bandlinie*.

The motif wavers between the 'tectonic' and the 'talismanic' styles, as is the case with at least one other seal from Siteia in Crete.[289] The main Π-shaped feature definitely belongs to the 'tectonic' tradition,[290] in which linear ornament dominates and few circular elements occur (and no centred-circles). The overall design, however, is reminiscent of the spray motif in the 'talismanic' style,[291] where the seal face is often divided into two sections by one or two horizontal *Bandlinien*. In such cases an oblique *Bandlinie* and one or two centred-circles are usual, while sets of oblique parallel hatching are attested in the zone below it/them.[292] This arrangement is nowadays termed pseudo-spray in the *CMS* and is mostly assigned a stylistic dating in the LM I period (with very few samples earlier and later than LM I). The fact that some sort of nexus exists between the 'tectonic' and the 'talismanic' spray motifs has been duly noted and discussed;[293] given the time frame for the two styles, this should probably be seen as a (direct or indirect) ancestor/heir relationship. Based on the above evidence, the lost seal from Akrotiri could very well have been a LM I product.

286 Fouqué 1879, 112.

287 Karnava 2014a; 2014b. See above pp. 55–56.

288 *Bandlinie*: The term refers to a broad groove which separates the seal face into distinct sections.

289 *CMS* IV no. 164 (Siteia).

290 For instance: *CMS* I no. 432; VI no. 174 (Knossos); IX no. 38.

291 Onassoglou 1985, 35–44, pls. XIV–XVII.

292 For instance: *CMS* II,3 no. 37 (Mavro Spelio Cemetery, Knossos); III no. 520; IV no. 86 (Siteia). Some with more centred-circles: *CMS* II,3 nos. 84 (sanctuary of Demeter, Knossos), 383; II,4 no. 192 (Archalochori); XI no. 163.

293 Onassoglou 1985, 35.

Fig. 37. The effaced disc-shaped lentoid **S9** with remains of centred-circles with central borings and lines (Akrotiri Excavations Archives/*CMS* Archive).

Fig. 38. An effaced standing quadruped in right profile on lentoid **S6** (Akrotiri Excavations Archives/*CMS* Archive).

AN EFFACED CENTRED-CIRCLES ORNAMENT AND LINES

The lentoid **S9** is quite worn and the motif is not preserved complete (*Fig. 37*). Four circles with central borings and two flanking lines attest to another version of the centred-circles ornament. Examples that can be compared in terms of decoration and seal shape do not come from archaeologically datable contexts, but a tentative stylistic dating seems to place them within the MM period.[294]

FOUR-LEGGED ANIMAL

The seal face of lentoid **S6** is extremely abraded, whereas the reverse face is in fair condition. The seal is engraved with a standing quadruped in left (seal face) profile (*Fig. 38*). The poor state of preservation of the motif does not allow for further comments.

THE GRIFFIN/SPHINX AND THE DOLPHIN

The hard stone lentoid **S12** carries what is probably the most sophisticated of the seal motifs found at Akrotiri: a griffin or a sphinx with a dolphin beneath its belly (*Fig. 39*). A straight

294 MM I–II: *CMS* IV no. 82. MM II–III: V Suppl. 3 no. 146; VI no. 160; VII no. 27.

Fig. 39. Griffin/sphinx and dolphin on lentoid **S12** (Akrotiri Excavations Archives/*CMS* Archive).

cut serves as a groundline, while in front of the creature, placed somewhat randomly, is another straight line. A curving line emanating from the head of the creature and running toward its wing may well be the customary 'plume' found on the heads of sphinxes, although here it is unaccountably crossed by a short-stroke.

The main motif was originally identified as a female sphinx,[295] but has since also been described as a possible griffin.[296] The creature is clearly endowed with a lion's body, as conventionally found in Minoan iconography: it has a slim body, prominent claws, upturned tail, and wings. Ordinarily one would expect a sphinx to have a human head, but here the head resembles that of a bird, raising the possibility that we are dealing with a griffin. The dots beneath its belly suggest that the creature is female, and indeed Younger has termed it a griffiness.[297] Whereas griffins are well attested in seal iconography, as well as in other artistic media during the Neopalatial period in both Crete and Thera,[298] sphinxes are not especially common. If **S12** does depict a sphinx, it would constitute one of the few early attestations.[299]

The retrieval of whole pots and numerous sherds depicting griffins in MC strata at Akrotiri[300] has prompted a discussion on the transfer of this motif from Syria, where it is thought to have originated. One of the suggestions put forward is that the new finds point to direct contacts between the inhabitants of the Cyclades and Syria.[301] However, Cretan

295 *Thera* V, 36, pl. 85a, b; *CMS* V no. 690.

296 In the electronic version of the *CMS* the creature is described as a griffin or a sphinx (*CMS Seal Database*, *CMS* V no. 690).

297 Younger 1988, 217.

298 For Crete: Dessenne 1957; Tzavella-Evjen 1970; Shank 2013. For Thera: Nikolakopoulou *et al.* 2008, 319; Papagiannopoulou 2008, 436–41.

299 The earliest sphinx can be found on a green jasper *Petschaft* from Archanes (*CMS* VI no. 128); therefore it should be attributed to the Protopalatial period. The only other example that can be attributed to the Minoan period is to be found among the Zakros sealings (*CMS* II,7 no. 88; but the identification is not certain). Further examples are attributed on stylistic grounds to the Mycenaean periods in Crete or the Greek mainland: e. g. *CMS* II,3 no. 118 (Agia Triada); V Suppl. 3 no. 352 (Mochlos); V Suppl. 3 no. 359 (Tripitos, Siteia); II,8 no. 194 (Knossos). The strong oriental affiliation of the motif is evident in its appearance on a number of cylinder seals retrieved from Mycenaean contexts in the Aegean (e. g. *CMS* I Suppl. no. 54 from Perati, Attica).

300 See Nikolakopoulou *et al.* forthcoming.

301 Papagiannopoulou 2008, 438.

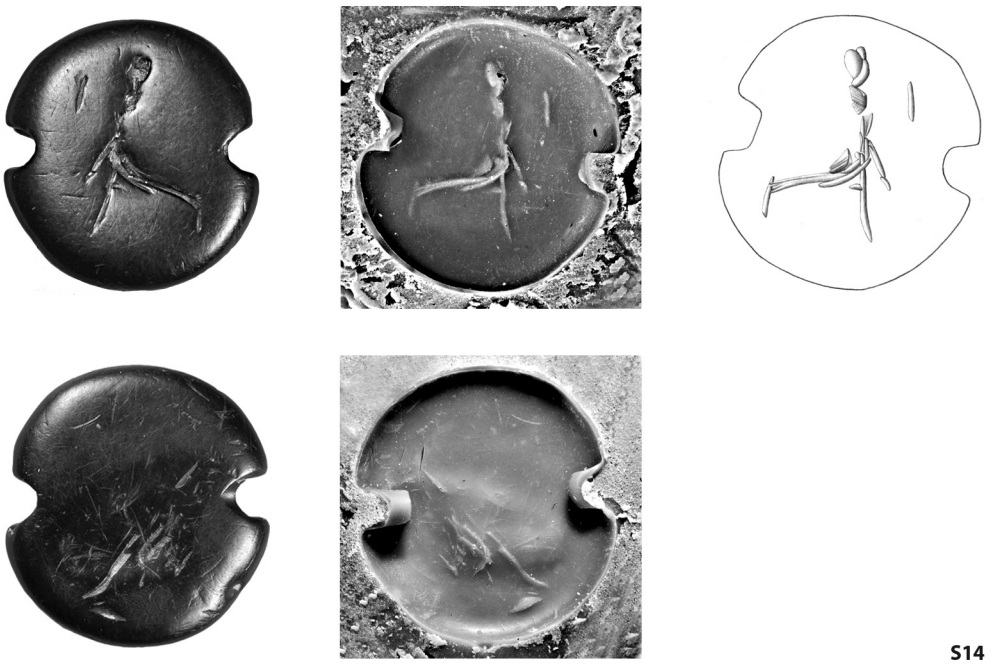


Fig. 40. A male figure on the soft stone disc **S14** (Akrotiri Excavations Archives/*CMS* Archive).

evidence predating that from Thera shows that the motif was adopted in the MM II period: details attested among the Phaistos seal impressions, such as the creature's scaly chest, point to its Mesopotamian ancestry.[302]

The small dolphin is a popular motif in Minoan iconography, and one which is thought to have been transferred to Theran art in the latest, strongly minoanizing, phase of the settlement.[303] Thus, this seal could conceivably enter into the discussion of iconographic transfers from Crete.[304]

On stylistic grounds the seal can be dated to the LM I period, and has been attributed to the so-called Jasper Lion Master, an early LM/LH seal group.[305]

THE HUMAN FIGURE

The two-sided (?) soft stone disc **S14**, the only seal found in Xeste 3, bears on one face an interesting and unusual motif. This can be tentatively identified as a human figure in left (seal face) profile in a walking or running pose (*Fig. 40*). Other than the figure, the seal face contains only a short vertical stroke in front of the figure. The second face of the seal shows traces of intentional engraving but these are superficial and no motif can be safely recognized.

302 D'Albiac 1995, 64.
303 Immerwahr 1990; *pace* Vanschoonwinkel 1990.
304 Immerwahr 1990, 245.
305 Betts 1981.

The seal probably depicts a man moving at speed, something that is indicated by the legs set wide-apart. The lines forming the 'body' are not very clear; perhaps the figure wore some sort of loincloth, suggested by the oblique stroke descending from the waist and turning back towards the knee. An unusual feature is that the figure is composed of very simple, sketchy strokes, which is hard to parallel among other renderings of human figures on seals.[306]

Male figures depicted on Minoan seals often seem rather static, with both their feet firmly placed on the ground, engaged in a variety of tasks, such as carrying something, fighting, taming/holding animals in the 'Master of Animals' pose, etc. Figures shown with bent knees could theoretically be seen as runners and are usually identified as bull-leapers or people interacting with an animal, e.g. a bull;[307] in these instances, the back legs of the men are sharply bent. A gold signet ring of Neopalatial date found in the sanctuary of Syme Viannou in Crete clearly depicts a male figure in running pose.[308]

Rarely are figures shown walking at a fast pace and their postures do not match precisely the figure on **S14**.[309] Very few motifs can be compared to the pose of this presumed human figure on the Akrotiri seal; in three instances the pose indicates people in movement: male figures in procession; a man pulling two other men or women behind him on a leash (?); a man pulling two women behind him again on a leash (?).[310] The difficulty in the present instance from Akrotiri is that the figure appears entirely alone, without other living beings or landscape, and is thus completely devoid of context.

One possible explanation for the peculiarities in this motif is that might be unfinished, a phenomenon occasionally attested in Minoan and Mycenaean glyptic.[311] This cannot be ruled out altogether, since details normally found in the rendering of human figures are simply absent. An element in favour of such an explanation would be the fact that the other side of the seal also probably carries an unfinished motif.

Motifs on Seals of Local Manufacture

The seals that appear to be of Theran manufacture are grouped here. Their motifs are too simple for extensive comparisons (*Fig. 41*).

unintelligible design comprising wavy and straight lines and a dot

The disc without a suspension hole **S7**, if a seal at all, bears an unintelligible motif. If a specific object or scene was intended, which is possible, it is certainly not clear. The engraved motif is composed of linear elements in combination with loops, seemingly extending towards random directions; the only recognizable patterns are a semi-circular line and a solid boring of a small size.[312]

306 Ingo Pini would rather identify it as 'vague remains' (pers. comm.).
307 Of LB I–II dating: *CMS* I no. 112 (Mycenae); V no. 638 (Koukounara, Elis, although in a LH III context).
308 Lebessi *et al.* 2004.
309 *CMS* V no. 173 (Agora, Athens); V Suppl. 3 no. 288 (Portes, Achaia).
310 Of LM I date: *CMS* II nos. 13–15 (Zakros); V no. 173 (of LB I–II date found in a LH IIIA1–2 grave in Athens); V Suppl. 1A no. 133 (Chania).
311 Sakellarakis 1972, 237–42.
312 Some similarity can be detected in the motif on a clay conoid dating to the EH II period from Lerna (*CMS* V no. 41).

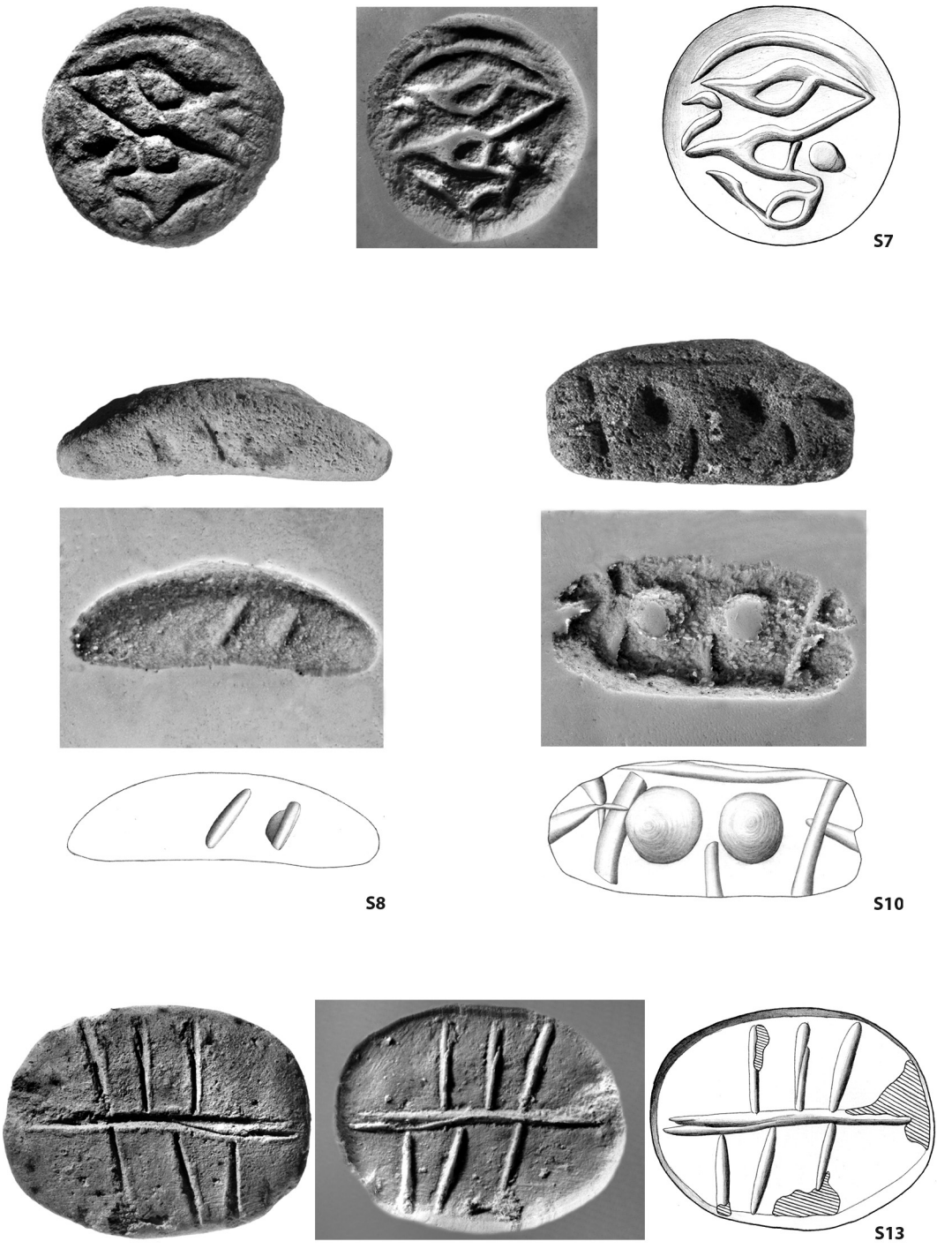


Fig. 41. Local production: disc **S7**, unidentifiable; pendant vertical plate **S8**, oblique parallel lines; pendant vertical plate **S10**, lines and borings; stamp **S13**, cross-hatching (Akrotiri Excavations Archives/*CMS* Archive).

BORINGS AND LINES

The pendant vertical plate **S8** presents two simple, oblique parallel lines. The seal is too worn to tell if anything else was engraved.

The pendant vertical plate **S10** bears borings and lines. Three lines could be seen as forming a loose Π-shape on the perimeter of the seal face, in which two large solid borings were engraved. A short line starts from the edge of the seal face and extends to the space between the two borings. It is not clear whether an oblique line that appears near one of the short sides of the face is accidental or not. Discernible in this motif is the effort of the engraver to square the curved perimeter of the engraved surface. This effort is obvious in that the only side of the seal face without an incised line is actually its only straight side.

SIMPLE DESIGN COMPRISING IRREGULAR INTERSECTING LINES

The clay stamp **S13** is decorated with a motif created through the combination of simple lines. The oval-shaped seal face bears a central line along the long axis and three incised lines arise from either side; all lines, including the central, are straight and of equal width

This motif is in fact so simple, that it could have been repeated at any time, without necessarily signifying influence or any kind of artistic impact. Similar motifs are attested in the Aegean on a number of seals dating from EM II until the MM IA period,[313] i. e. seals essentially belonging to the second half of the third millennium BC. However, the third millennium BC is a time when Aegean seal production was not centred solely in Crete; common glyptic elements were to be found in Crete, the Aegean islands, the Greek mainland, and also Anatolia.[314]

DISCUSSION: SEALS AS A FOREIGN BODY AT AKROTIRI

The Number of Seals

More than 40 years of excavations at the site of Akrotiri in Thera have produced a relatively small number of objects which can be identified as seals: just 16. Akrotiri is a prolific site in terms of archaeological finds, yet seals are far from frequent. As an archaeological site Akrotiri is exceptional because of its extraordinary taphonomic conditions; unfortunately, it is practically impossible to establish whether it was literally exceptional for its time. But there is nothing 'normal' about Akrotiri when compared to the evidence from standard excavations in the Aegean, and especially from Minoan Crete, datable to the second mil-

313 Some seals with this exact motif and stylistic dating: a steatite pendant seal (*CMS* III no. 60, Crete); a bone 'telephone receiver' (*CMS* III no. 6, Dictaean Cave, EM III–MM IA); a steatite cylindrical 'hammer-head' (*CMS* IV no. 65, Kaloi Limenes, EM III–MM IA); a steatite conoid pendant seal (V Suppl. 1A no. 234, Moni Odigitria, EM [?]); a steatite concave stamp-cylinder (V Suppl. 1A no. 270b, Moni Odigitria, EM III–MM IA). Also note the EB II sepiolith cylindrical 'hammer-head' (V Suppl. 3 no. 374, Kadmeia, Thebes, context EH II).

314 A foot-shaped seal with a simple lattice motif from Küllüoba in Anatolia is such an instance (Efe 2007, 58, fig. 15a). The specific seal shape, which is attested in inland Western Anatolia, is thought to have spread as far as Syro-Cilicia. Numerous specimens from the Aegean are listed in Pini 1972.

lennium BC. There may be various reasons for the small number of seals, which we will consider in the following paragraphs.

One might suppose that further examples existed in the excavated interiors of houses, in the debris of open-air spaces and in substrata of floors. We cannot entirely rule out the possibility that small objects such as seals escaped attention during excavation or even sieving; if this did occur, it must have been the exception. Sieving the soil and/or volcanic depositions, which were extracted from indoor and outdoor spaces alike, was practised from the outset in the excavation of Akrotiri. The excavation catalogues list innumerable tiny objects, which are registered as having been retrieved in sieving. With this in mind, we can accept the small number of seals as representative, reflecting with relative accuracy the true archaeological situation.

The volume of pottery, as measured in wooden crates, which was collected during the recent extensive excavations between 1999–2003, when more than 110 trenches were excavated all over the site, is about the same as extracted during the preceding 20 years or so. In other words, in just five years a considerable amount of archaeological material was retrieved, roughly comparable in quantity to the finds made prior to 1999. The new trenches yielded seals **S1**, **S2**, **S3**, **S4** and **S15**, indicating that the seals retrieved in older excavations were as meticulously collected as in the more recent ones, and vice versa. The difference in the quality of deposits excavated in the older as opposed to the recent excavations is notable, since the former concentrated in interiors of LC I buildings, whereas the recent tried to avoid them by penetrating into layers earlier than the VDL. For the first time, seals can be safely attributed to earlier layers, which despite their great volume, appear to have produced fewer seals when compared to those found in the LC I buildings.

It is also pertinent to stress that very few buildings from the settlement at Akrotiri have been fully excavated, namely the House of the Ladies, the West House and Xeste 3. The House of the Ladies has produced no seals, whereas the West House and Xeste 3 yielded one seal each, **S5** and **S14** respectively. Keeping in mind that **S1**, **S2** and **S9** were found in the interior of partially excavated buildings (Western Quarters; Delta-North), **S4**, **S10** and **S15** under floors as discards from earlier phases (NPP 67; Delta-West; Building Iota Beta (IB)/NPP 44A), **S3** in a rock-cut underground chamber, of which very few were excavated (NPP 26NE), similar finds may be expected in future.

The Findspots of Seals

Although contextualization of objects retrieved in excavations is a prime archaeological concern, we should not take for granted that the findspots of seals will necessarily shed light on their use or function. The only instance that is immediately telling — but still raising further queries — is when seals are found in graves. In the case of grave goods one, almost automatically, thinks of private property that the owner or his/her descendents could afford to remove from circulation.[315]

315 But even in the instance of seals as burial goods not all is straightforward: the occurrence of heirloom seals in LM III tombs could point to family rather than strictly personal possesion of seals (see further below, n. 333); also, evidence points to unused seals deposited in graves, therefore intended for funeral consumption, a practice which again undermines the notion of seals as personal items (Anastasiadou 2015, 266).

But when seals are found in habitation sites their role is less clear. The most common assumptions, even when not explicity stated, are that they were personal property and served as items of personal adornment.[316] The burials belonging to the inhabitants of Akrotiri throughout its long life have not been detected and they probably await discovery somewhere underneath the thick pumice surrounding the site. Some EC burials in clay vessels,[317] excavated recently within the site, have not produced any seals as accompanying grave goods.

The situation in Crete differs, especially regarding the LM IA phase of the Neopalatial period, which corresponds to the latest phase in the life of Akrotiri. Few of the c. 1800 surviving Neopalatial seals come from securely-dated contexts; and graves of this period are exceptionally rare.[318] This makes it hard to judge whether any were made explicitly as grave goods, as has been suggested for certain seals of LB III date.[319] However, potential mortuary associations do not preclude the use of seals prior to their deposition in graves.[320] Whether this applied to Akrotiri remains an open question.

Seals **S3**, **S4**, **S6**, **S7**, **S8**, **S10**, **S13** and **S15** have been termed here as 'ancient discards',[321] since they were retrieved from levelling layers, debris in open-air spaces and from under the floors of rooms functioning during the LC I period. However, the contexts and the dates of certain of these discards present some interest. The black steatite pendant vertical plate **S3** is a relic of a habitation phase dating back to the MC A ceramic phase of Akrotiri, which corresponds to MM IA in Cretan terms. The smoky quartz amygdaloid **S4** is part of an assemblage of apparently precious objects dating to the MC C, which corresponds to MM IIIA in central Cretan terms. The *Petschaft* **S15** was made of some sort of calcareous material and was part of a room's floor substratum, which is dated in the MC D phase and corresponds to the later phase of the Cretan MM III period.

When examining the distribution of seals in the settlement apparently found *in situ*, we encounter seals **S1**, **S2**, **S5**, **S9**, **S11**, **S12** and **S14**, that came from the interior of buildings (Western Quarters/Complex Alpha [A]; West House; Delta-North, Delta-East, Delta-South/Complex Delta [Δ]; Xeste 3). Only in one instance were seals **S1** and **S2** found practically together (Western Quarters/Complex Alpha [A]). Although we do not know how long these seals had been kept in those rooms, with the exception of **S5** from the West House, which is decidedly old for its context, all the other seals seem to fit well within the time frame offered by the contexts of these rooms, namely the LC I period. We can add that with the exception of **S10** from Delta-North and **S14** from Xeste 3, for which a provenance from upper level rooms cannot be excluded, all other seals were found in ground-floor level rooms.

Regarding the character and function of the ground-level rooms where seals were found, ground-level Room 3 in the Western Quarters of Complex Alpha (A) could offer insights into the function of seals **S1** and **S2** found in there, since its contents appear to be *in situ*.

316 A relevant discussion in Krzyszkowska 2011.

317 *Praktika* 1999, 167, pls. 101b, 102a–b (NPP 58A); *Ergon* 2000, 92, fig. 103; *Praktika* 2000, 170, pl. 120a (NPP 6); Maniki forthcoming.

318 Krzyszkowska 2005a, 120.

319 Krzyszkowska 2005a, 270–71.

320 See, for instance, *CMS* II,2 no. 57.

321 Not necessarily deliberate discards; other factors could account for the presence of seals in debris or levelling layers, such as accidents, losses etc.

The room, however, is only partially excavated, its size is not even known, and we are therefore lacking a full record of what it contained. Chances are that it was a household activity area or a storage area for perishable goods, whereas pottery storage can be excluded on account of the low number of pots recovered in it; until the whole room comes to light, it is premature to suggest anything. For now, we may observe with certainty that the room was, in a sense, located at the rear of the building: to reach it from the entrance meant passing through at least one other room.

Ground-level Room 5 from the West House produced a single seal, **S5**. The fact that the seal has a shape and decoration that conform to periods much earlier than the room's use, or the building itself, for that matter, does not automatically make it a discard: later use of earlier seals cannot be ruled out, and there is really no way of telling whether the seal was already broken when retrieved. Assuming that the seal still had some use inside Room 5, we ought to be looking at another direction, namely the use and meaning of heirlooms. However, both interpretations — as a discard or functional object — appear equally arbitrary. We note that Room 5 on its ground level was a storeroom, again situated at a considerable distance from the entrance of the West House.

Ground-level Room D9.1 in Delta-East has given us seal **S11**. It probably functioned as a storeroom, chiefly for pottery, a fact which does not preclude the additional storage of other items, such as stone objects, two lead weights, and even a possibly slaughtered animal. The room is found practically in the back of the building unit and at a considerable distance from the entrance, and one would have to pass through most of the ground-floor rooms in order to reach it.

Seal **S12** was retrieved in Room D16, the largest room in building unit Delta-South. This context is interesting in that D16 deviates from the previously laid out rooms. Room D16 appears to be the most 'extroverted' room in its unit, with a large window overlooking the street and relatively easy access for incomers passing under the staircase in front of the entrance; it contained an impressive variety of precious objects. If some sort of transactions, perhaps of a mercantile nature, took place there, it is not certain that the seal had any immediate relation to them. Assuming that it did, however, does not automatically exclude the storage of goods in that room. But whereas the objects in D16 may have been stored for trading, Room 3 of the Western Quarters, Room 5 of the West House and Room D9.1 of Delta-East were locations where objects were simply stored.

The last context worth discussing is that of seal **S14**, found in Xeste 3. The seal seems to have been kept in the rear section of the building, although it is not entirely secure which room or floor it originated in. Regardless of whether the rear section of the building can qualify as a 'service' area, we can immediately see that access from the streets and the open-air, public spaces of the settlement was not easy.

Common to the ground-level rooms containing seals is that, in all probability, they functioned as storage spaces, situated, with the exception of D16, at the back of buildings when the entrance lay at the front. Storage, however, is simply a preliminary interpretation, which says absolutely nothing about the ultimate and true use of the stored objects. The instance of D16 is telling in this respect, since the objects found there were, in a sense, stored for purposes that evidently go beyond functions and demands of simple household level. The probable storing of seals along with a series of other objects cannot, therefore, reveal on its own where and if seals had some meaning, purpose and/or practical use at Akrotiri.

The Materials, Shapes and Motifs of Seals

All the seals found at Akrotiri are made of stone, both soft and hard, except for one clay example. The unique locally-produced conoidal clay stamp **S13** follows a long tradition from the Neolithic onwards and extending from Mesopotamia to Europe. Some standardization in the shape of clay conoids appears in the third millennium BC and among the latest attested are examples from the Cretan Prepalatial period at the turn from the third to the second millennium. The presence of such a clay seal in the VDL level at Akrotiri, whether or not contemporaneous with its context, testifies to the survival of earlier traditions at a time when these had long become obsolete in Cretan and Aegean seal production.

A 'traditionalist' perspective can be further discerned among the shapes of the few locally-made seals. Apart from the obscure disc without any suspension hole **S7**, the remaining local examples **S8**, **S10** and **S13** share one characteristic: all were meant to be suspended by holes on their upper part. In other words, their shapes resemble what we would call pendants, to be worn around the neck. As **S3**, a hard stone pendant and the earliest seal retrieved at Akrotiri, demonstrates, the fashion for seals of this type was current during the third millennium BC and continued to evolve into the early second millennium, with Protopalatial *Petschafte* among the latest representatives of stamp seals.

But from the first half of the second millennium BC onwards, seal shapes in the Aegean changed significantly; axial shapes furnished with suspension holes on their short, undecorated sides became popular, such as discs, discoids, three- and four-sided prisms. Engraved decoration on multiple sides of the same seal makes their suspension as part of a necklace or a bracelet questionable, since not all of their decorated faces would be visible, assuming of course that this was of some importance. However, while not stressed often enough, the Cretan Protopalatial period saw the creation of artefacts that yielded more to superior aesthetic demands than to practical;[322] the argument of poor visibility-equals-impracticality does not apply here. For the Neopalatial period, when single engraved faces became the norm, we have some iconographic evidence that seals were worn on the wrist coming from the well-known Cup Bearer Fresco from Knossos and the bull-leaping wall painting from Tell el-Dab'a. The appearance of signet rings also marks an innovation in seal shapes during the Protopalatial period,[323] which survives into the LBA, perhaps because of the prestige displayed by gold rings of Minoan origin. Yet local seal production at Akrotiri, as attested through these very few examples, appears to be largely ignorant of prevailing Minoan trends, despite the fact that imports occurred side-by-side with local examples. Therefore, ignorance of Minoan advances in seal manufacture can only be seen as wilful on the part of the Akrotiri producers.

To return to materials, although Akrotiri attests to numerous metallic objects, many are heavy and cumbersome; so it is hardly surprising they were left behind when the inhabitants ran for their lives. By contrast, metal seals or signet rings could easily have been taken away by those on the run. The discovery of a metal ring, though not a signet ring, at the set-

322 The idea is beautifully summarized in Knappett 2008.

323 The seal impressions from Phaistos long ago demonstrated the existence of signet rings as early as the Protopalatial period. Actual finds of metal signet rings include a specimen from Archanes (Panagiotopoulos 2002, 89–92, no. E20) and a recent find from Petras (Krzyszkowska 2017, 153–54, fig. 8).

tlement of Raos in Thera,[324] a site contemporaneous to the LC phase at Akrotiri, alerts us to the possibility that signet rings might have reached Akrotiri. However the Raos ring, while obviously an object of personal adornment, is far removed from signet rings, which could serve in a hierarchical, strictly organized administrative system. There is no way of telling at this point whether or not the absence of metal signet rings from Akrotiri reflects reality, but further evidence to be laid out below probably suggests that we should not expect such finds in the future, at least not from the VDL layers.

Among the seals previously listed as genuine Cretan Neopalatial products, retrieved from contexts of the LC period (**S1**, **S2**, **S6**, **S9**, **S11**, **S12**, **S14**, **S16**), only **S1** and **S12** are recognized as jasper and **S6** is possibly also of jasper. The remaining seals, constituting the majority, are all made of soft stones, either of unspecified kind or of serpentine and steatite. Cretan evidence shows that some added social value should be taken into consideration when examining hard stone Minoan seals; they involved specialist technology and often the materials themselves were imported.[325] In the case of local production, however, it is hard to suggest added social value to seal **S10**, made of the extremely hard, volcanic stone, a material freely and abundantly available all over the island; its simple motif indicates low investment of expertise and craftsmanship. Two more local products, **S7** and **S8**, were in all probability made from soft versions of volcanic tuff and testify to extremely basic and crude decorative motifs. This reinforces the picture of almost non-existent engraving skills at local level; the local clay seal **S13** does not appear to require any high-level expertise in its manufacture either. The case of jasper seal **S12** is interesting, since it may have been kept in Room D16 in order to be traded. There is no way of telling whether the final recipient would have been someone from Akrotiri or Thera itself, since the variety and quantities of objects kept in that particular room for trading may have been destined for 'clientele' within or outside Akrotiri. In this last scenario, Akrotiri, through room D16, would have functioned as an 'international' trading hub and **S12** may have been an object in transit rather than a locally active seal.

The fact remains that the overwhelming majority of Neopalatial seals from Akrotiri are made of soft stones. This observation is interesting when combined with evidence from the shapes of Neopalatial seals. All Neopalatial seals from Akrotiri are lentoids (**S1**, **S2**, **S6**, **S9**, **S11**, **S12**), with the exception of **S14**, a disc, and the possible exception of **S16**, which could have been a lentoid, a discoid or a disc. Lentoids represent the most common Neopalatial seal shape; their continued popularity in the Mycenaean period has resulted in some 4000 examples surviving from the second millennium Aegean. Far less frequent than lentoids are amygdaloids, with about 1000 examples and cushions with fewer than 300. As previously stressed, the single amygdaloid **S4** retrieved at Akrotiri represents social circumstances in phases predating the LC/LM periods: only partially investigated, they are poorly understood. Although it is problematic to attribute prestige value to a particular seal shape, the numbers speak for high popularity of lentoids in Minoan-Mycenaean times. The evidence from Akrotiri shows that virtually all seals that reached Thera during the Neopalatial period conformed to contemporary Cretan norms in terms of shape. Whether

324 The recovery of the metal ring was announced in a lecture by the excavator, M. Marthari: 'Raos: a new late MB and early LB site with frescoes on the southern part of the caldera, Thera' (November 9, 2009; Danish Institute, Athens); for a preliminary presentation of the site, see Marthari 2004.

325 Betts 1989, 9–17; Müller 2000; Krzyszkowska 2005a, 81–85.

the high frequency of a seal shape points to its characterization as average or mainstream, notions that are meant to be understood here as negative and positive qualitative judgements respectively, is a matter that has not been addressed in current literature and therefore remains open.[326]

The colour of certain lentoids also merits comment. Several, such as jaspers **S1** and **S12**, probable jasper **S6** and soft stone **S2** display shades of red, while others, such as the serpentine **S9** and **S11** are green. Apart from the possibility that reddish shades may have held a special significance, the occurrence of red jasper examples is also noteworthy for another reason: it has been suggested that green and red jaspers were among the most commonly used colour varieties of jasper in Aegean seal manufacture as opposed to black, yellow and white jaspers.[327] There is no way of telling how these seals reached Akrotiri, i. e. whether they had been commissioned with specific requirements or not, or whether people acquired what was available. In this respect, the coincidence (?) of this small majority of red-coloured lentoids cannot be attributed with certainty to the procurer's or the acquirer's disposition.

The last observation likewise applies to the motifs and techniques represented among the Akrotiri seals. Seals **S1**, **S4**, **S2** and **S11** can be attributed or are related to the 'talismanic' style, seal **S16** wavers between the 'talismanic' and the 'tectonic' style, and a Protopalatial hatching motif with certain similarities to the 'tectonic' style is also attested on face b of seal **S5**. The 'tectonic' style is represented by fewer than 150 surviving examples, and ancient impressions are relatively infrequent, though one occurs among the Akrotiri sealings. The remaining seals — and the discussion here is mostly about Neopalatial seals in LC levels — present us with relatively simple motifs: **S6** probably bears a quadruped, while face (a) of seal **S5** and **S9** bear simple geometric motifs. The most intricate motif is in fact the representation of a sphinx/griffin with a dolphin on **S12**, a seal for which it is debateable whether it was even destined for local use and consumption in the first place. Also noteworthy is what appears to be a rare representation of the human figure on seal **S14**, albeit executed in an extremely simple, even sketchy, manner.

The sense we obtain from the motifs attested at Akrotiri is that of seals belonging to extremely diverse categories of Minoan decorative motifs. The 'talismanic' category of seals stands out among these, its origins, role and meaning having been extensively discussed in the literature. While the term was coined by Evans and the seals decorated with 'talismanic' motifs came to be invested in modern scholarship with some potentially secretive, ritual and symbolic meaning, it has been established that the motifs are in fact the result of specific techniques employed for the speedy manufacturing of seals.[328] The repetition, the seemingly meaningless combinations of motifs previously-known as Hieroglyphic script signs but now used as decorative,[329] and the lack of labour-intensive modelling point to a

326 An interesting parallel discussion runs in recent literature on the standardized production and consumption of plain conical cups, again a Neopalatial phenomenon (Hilditch 2014; Knappett – Hilditch 2015a). Pottery experts frequently discuss standardization of pottery production, a notion they often combine with craft specialization and cost-effective processes (Kotsonas 2014, 12–13; see also the seminal discussion in Costin 1991, 33–39).

327 Dionisio *et al.* 2014, 21.

328 After Onassoglou's pioneering study (1985).

329 Onassoglou 1985.

category of serially-produced seals that are represented by more than 1000 extant examples. Once again, a potential distinction between average and mainstream would help us better understand the process of this relative standardization of production in Neopalatial glyptic. The popularity and diffusion of 'talismanic' seals is certainly well attested: not only are they common on Neopalatial sites, but are also found widely across the Aegean and in much later contexts.[330]

Still, beyond the fact that 'talismanic' seals are a numerous category of Cretan Neopalatial seals, little is known about their production sites within Crete and their social meaning, if there was a particular one. What we know is what 'talismanic' seals were not: on present evidence, they appear to have been minimally used for stamping,[331] they therefore did not belong to the administratively active seals. This near exclusion of 'talismanic' seals from the stamping/administrative circles in Crete places them automatically in a different environment and social meaning than seals that participated in administrative procedures. I have discussed this matter elsewhere,[332] but it is worth repeating that the fact that there exists a single semantic group, that of seals, does not mean that all members of this group were of equal standing or importance. That 'talismanic' seals were mostly found in graves in the role of grave goods, does not automatically make them personal possessions or valuables either: it only makes them what they are presented as, namely grave offerings that accompanied the deceased.[333]

The combined evidence pertaining to the materials, shapes and motifs attested among the Akrotiri seals paints a complex and not readily understandable picture, one to be further elaborated in the concluding remarks of this monograph.

330 Krzyszkowska 2005b; 2011, 442–46.

331 Seal impressions of 'talismanic' seals are so few, that they can be listed easily: *CMS* II,6 nos. 59, 129–134 (Agia Triada); II,6 nos. 157–158 (Gournia); II,7 no. 106 (Zakros); II,8 nos. 144–147 (Knossos); V Suppl. 1A no. 127, 181–182 (Chania). See previously Karnava 2011, 91, where it was calculated that some 25 'talismanic' seals out of c. 500 Neopalatial seals that are known to have stamped sealings are attested to have been administratively active, with the numbers deduced from Onassoglou 1985, 203–93, 304–05; more recently however, see Krzyszkowska 2005a, 133–37; 2011, 443, fig. 3.

332 Karnava 2011.

333 See, however, Krzyszkowska 2011, 442–43, fig. 3, where a more nuanced picture emerges: 'talismanic' seals were overwhelmingly found in graves only if we take into account combined evidence dating from MM III to LM III; as far as the Neopalatial period is concerned, more 'talismanic' seals seem to have been found in settlements rather than graves. In this equation we need to take also into account the well-known problem of the dearth of Neopalatial burial sites.

CHAPTER 2: THE IMPRESSED NODULES

The 1993 excavation season at Akrotiri yielded an exciting and rather unexpected new find: the impressed clay nodule **N74** that was retrieved from the ground-level Room D18, a part of Delta-East.[334] The room, like much of the E part of Complex Delta (Δ) as well as the E part of Building Beta (B), was situated under the bed of a modern torrent, which had cleared away parts of the upper floors and their contents.[335] Luckily this room had almost its entire ceiling preserved in place. However, as the excavation progressed, it became apparent that the room, originally thought to be a single space, was in fact divided into two rooms through a median wall with an E–W orientation. The room to the S was named 'D18a' and the room to the N became 'D18b'; the newly discovered nodule had actually been found in D18a. During the 1995 excavation season nodules **N1**–**N73** were found in the adjacent Room D18b. The small fragment of impressed nodule **N75** was recovered in 1999 while excavating the foundation of the pillars for the new shelter: this last nodule was found in NPP 64, which was sunk into an open-air space to the S of Xeste 2.

The nodules, found in three separate findspots within the settlement, share a common characteristic, in that they are all of non-local clay. In all cases the clay was brownish-red in colour, whereas Theran products in clay indicate local sources were buff-colours, at least at the time of the VDL. The unique benefit offered by the Akrotiri evidence is that the nodules are unfired, since there was no fire destruction in the settlement; they thus preserve their clays' original colours, making their identification as non-local secure.

Contrary to popular belief, the settlement of Akrotiri did not perish under a hot, pyroclastic lava flow; the city, together with the whole island, was buried under layers of pumice and ash.[336] Although accounts of volcano eruptions occurring in historical periods testify to what is described as 'a rain of hot ash', the temperature of the ash that fell on Akrotiri has not been established. Indeed the retrieval of organic remains in open spaces of the settlement, such as intact reed baskets, wood, strings of vegetable fibers etc., argues against high ash temperatures.[337] In addition, there is no evidence of conflagration in any of the Akrotiri buildings or their contents.

These nodules are important not only because they were brought in to Akrotiri from elsewhere, but for a variety of other reasons. Firstly, their overwhelming majority belongs to a type of nodules well known from Cretan contexts of comparable dating, the so-called flat-based nodules.[338] Secondly, they bear a variety of seal impressions, some of which originate from gold rings and stone seals of exquisite craftsmanship. Thirdly, they present a rich iconographic repertory, which encourages extensive discussions of ideology, religion, power and the economy of the period. Lastly, they attest to the use of a large gold ring

334 See Chapter 1, p. 25 for the division of Complex Delta (Δ) into four different building units.

335 A modern torrent, which crossed the settlement in a N–S direction, had swept away the volcanic depositions in its path and had reached the pre-eruption levels; the torrent was redirected in 1968 to protect the buildings which were beginning to be uncovered (*Thera* II, 5, 7, pl. 1). The torrent bed is noted in Doumas 1983, 46–47, fig. 5.

336 A succinct description in Friedrich 2009, 79–98.

337 For the conditions under which organic materials were preserved in open-air or closed spaces, see Michailidis – Angelidis 2006.

338 Hallager 1996, 135–58.

Fig. 42. Minute nodule pieces from Room D18b; they do not join to any of the numbered nodules, therefore no catalogue numbers were given (Akrotiri Excavations Archives).

known to have been responsible for impressing sealings found at the Cretan sites of Agia Triada and Sklavokambos in LM IB.[339] The fact that the very same ring had stamped sealings at different sites and with a certain chronological gap has no precedent in existing evidence from the Aegean Bronze Age.

The catalogue of impressed nodules contains 75 entries (**N1–N75**). Initially the number of nodules in Room D18b was thought to be 58,[340] and together with nodule **N74** found in Room D18a they amounted to 59 specimens. It was on these nodules that the preliminary account[341] and their subsequent inclusion in the *CMS* were based.[342] Since then nodule **N75** was recovered in NPP 64A[343] and a further 15 pieces from Room D18b were catalogued by the author,[344] since their size or fragments of seal impressions meant they merited coverage in the full publication of the material.[345]

The main hoard of sealings retrieved in Room D18b accounts for 73 entries in the catalogue. However, this does not automatically mean that the hoard consisted of this

339 Krzyszkowska 2005a, 190. For a discussion of the repercussions of this conjunction, see Karnava 2011, and the main discussion on this phenomenon in Chapter 4, pp. 192–94, 203–10.

340 **N1**–**N9**, **N11**–**N35**, **N38**–**N40**, **N42**–**N56**, **N58**–**N60**, **N69**, **N71**–**N72**.

341 Doumas 2000b.

342 *CMS* V Suppl. 3 nos. 391–405.

343 Karnava 2008, 380–81.

344 **N10**, **N36**–**N37**, **N41**, **N57**, **N61**–**N68**, **N70**, **N73**.

345 Apart from these 15 fragments, nine more had been recorded in the excavation registration catalogue (A11678, A11681, A11683, A11688, A11690, A11691, A11693, A11694 + A11696); but these were subsequently joined with eight of those that had been initially catalogued (**N26**, **N15**, **N4**, **N24**, **N33**, **N13**, **N44**, **N12** respectively).

many nodules. Among the catalogued examples, six could well have been parts of larger nodules, even though no joins can be established between them.[346] Given, therefore, the state of preservation one may safely conclude that the hoard in Room D18b consisted of at least 67 nodules, although others evidently existed. Exactly how many more is difficult to say; however, it seems that this minimum number is not far from their actual number. In addition, 29 very small pieces, measuring 0.5–1 cm, with no traces of seal impressions or any other imprints, were left unnumbered (*Fig. 42*). Their quantity suggests that, put together, they could have accounted for one or two more nodules of the largest size, or they may have formed part of the numbered nodules, which are missing some small parts. If the two nodules from Room D18a and NPP 64A are added to the calculated minimum of nodules from Room D18b, the minimum of sealings retrieved at the whole site of Akrotiri reaches 69 pieces.

This chapter starts with a discussion of the archaeological contexts in which the nodules were found. The typology of the nodules is then reviewed, examined and compared to known types from Minoan Crete. Then follows a consideration of the decorative motifs attested on the sealings and their potential importance. The chapter closes with a discussion on the presence of the sealings at Akrotiri and their role.

THE CONTEXTS: D18 AND AN OPEN-AIR SPACE

Three separate localities within the site of Akrotiri are discussed here, constituting the findspots of the impressed clay nodules. The close physical proximity of two, D18a and D18b, does not guarantee any particular relationship between their contents: neither do the rooms' contents present us with similarities, nor does nodule **N74**, retrieved in Room D18a, share a common seal impression or belong to the same nodule types as nodules **N1**–**N73**, all found in Room D18b. Whether a distinct role should be attributed to Complex Delta (Δ), or, at least, to the building unit Delta-East, where Rooms D18a and D18b are situated, based on the retrieval of the sealings, will be discussed further below.

The single nodule **N75** recovered in NPP 64 attests, in turn, to a seal impression not encountered either among the seal impressions in D18b or the one in D18a, and also belongs to a different nodule type than the rest; its context also diverges from the other two, since it was found in an exterior space.

Delta-East: Rooms D18a and D18b

Parts of the building unit Delta-East had already come to light in 1970, when most of Complex Delta (Δ) was excavated.[347] Room D2, the 'Lilies Room', and the area immediately to its E, initially called 'The Eastern Quarters', were the first to be revealed;[348] difficulties lay in the fact that the area to the E had been under the bed of a modern torrent until 1968.

346 **N61**, **N63**–**N67**.

347 *Thera* IV, 10–28, plan I. The building was called, at the time, invariably 'Sector Delta' and 'Xeste Delta'. For the notion of the 'building unit', see above p. 25.

348 *Thera* IV, 20–26. The room, other than Room D2, investigated in that year to the NE of Room D2, was later numbered as 'Room D17' and it actually belongs to Delta-North.

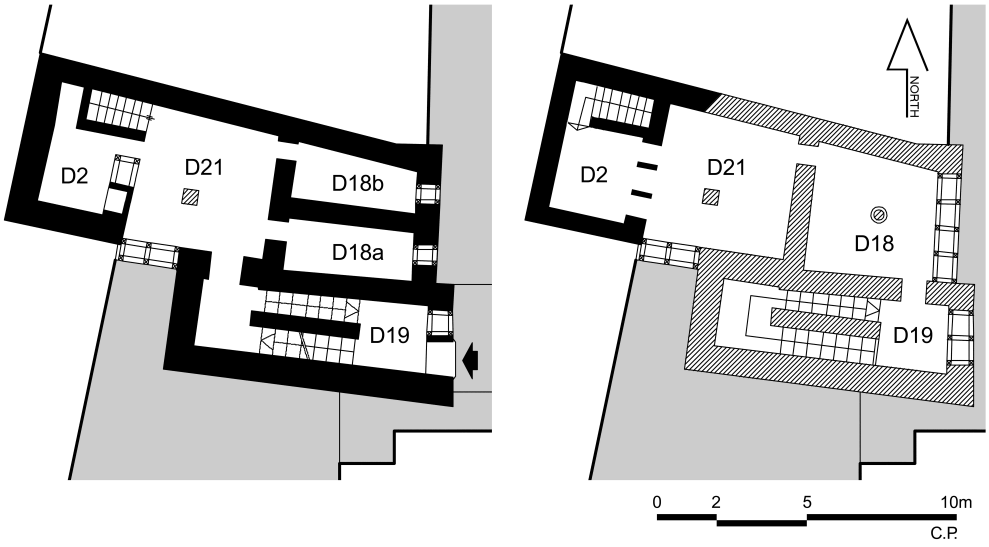


Fig. 43. Delta-East: plan of ground (left) and first (right) storeys (Palyvou 2005, 92, fig. 126; image courtesy of INSTAP Academic Press, Philadelphia, PA, USA).

Room D2 attracted the excavator's attention quickly and most naturally, since it contained an impressive variety of movable finds. In addition, still preserved, decorating three of its walls was a complete undamaged wall painting, the so-called Spring Fresco; to this day, this remains the only wall painting to be found truly *in situ*.[349] From the outset Room D2 and nearby Room D17 led the excavator to think of rooms 'of religious nature' due to the 'sacred' character of their contents. The upper and lower levels of Rooms D17a and D17 were again investigated in 1973, and Rooms D18 and D19 were first detected and numbered during that year.[350] Room D18 was not investigated, because it was '… full of holes from missing wooden pieces', whereas D19 was soon identified as having been a staircase (*Fig. 43*).

D18a (1993, 1994 excavation seasons)

Investigations in Delta-East resumed again only in 1993.[351] The E section of the room, until then designated as D18, preserved the ground-storey ceiling, therefore also the first-storey floor. By contrast, the W section of the room had been swept away by the modern torrent, since it was situated exactly inside the bed of the torrent; as a result, the ceiling and parts of the walls were missing to a distance of 1.69 m from the W wall. In addition, a retaining wall oriented N–S had been constructed in modern times to regulate the water course, which had penetrated into the pre-eruption layers as deep as half-way to the ground-level height (*Fig. 44*). The ground storey was found full of impure volcanic ash, the presence of

349 Doumas 1992, 98–107.
350 *Thera* VII, 13–15.
351 *Praktika* 1993, 181–83, pls. 108b–113.

which was interpreted as the result of infiltration by water from the torrent. The E preserved lower-level half was divided by a median wall into two 'compartments': the S was designated as 'a' (W. 1.65 m) and the N as 'b' (W. 1.40 m). It has been suggested that the two compartments were initially one room, which was divided in two after the SDL.[352] New evidence, which came to light during recent excavations, has provided a date for the construction of the E wall of D18a, namely during the early LC I phase, i. e. before the SDL.[353] In light of this information, it seems reasonable to assume that the strong seismic event attested through the SDL probably prompted the division of the room; the room itself, however, had only been constructed at the beginning of the LC I period.

In an effort to preserve the ground-level ceiling, where it still existed, excavation proceeded by an unorthodox method. The fill removal did not follow the horizontal axis; instead, it was decided to clear vertical *loci* and thus to excavate from W to E. In 1993 (and 1994, see further below) the investigation focused on D18a, which produced an impressive number and array of movable finds. The tight packing of objects and their disorderly placement meant the room had little potential for actual use.

The investigation in the W section of D18a, which was missing its ceiling, proceeded in the classic excavation method, from the upper levels to the lowest, in an area measuring (W) 1.9 × (N/S) 1.18 × (E) 1.7 m, since the room was narrower towards the E. It was discovered that the 1970 investigation had actually reached a preserved part of the floor at the SW corner of the room, made of beaten earth with the addition of small pebbles, which was then covered by plastic.[354]

The investigation in the W end of Room D18a, i. e. near its entrance, produced the following items, which are more or less visible in *Fig. 45*. Two clay slabs and a large jug leaning against them were found in the middle of the N wall. In the NE corner beneath a niche in the wall was a tripod cooking pot turned upside down on a small *asaminthos* ('bathtub'),[355] which turned out to contain eight tripod cooking pots. Two pieces of wood further came to light in the SE corner, while another *asaminthos* was retrieved from the middle of the S wall–SW corner. [356] The second *asaminthos*, fragments of which had already been detected in the 1970 season and left on the spot, stood immediately to the E of the SW corner. Both conical and Cycladic cups of different sizes were found in various spots, usually in groups; animal bones were also habitually recorded, even inside the cooking pots in the *asaminthos*.

The interior of the *asaminthos* in the SW corner of the room created a micro-context of its own. This produced — in very close proximity and near its bottom — a small alabaster amphora-rhyton,[357] a small one-handled bronze vessel in pieces, a bronze dagger with a wooden shaft,[358] Linear A tablet fragments,[359] a bell-shaped lead object with a bronze

352 Polychronakou-Sgouritsa 2008, 154.

353 Kariotis 2003, 436, 442.

354 The 1970 daybook does not record any movable finds from that part of the room, which is mentioned as 'space to the E of D2'. It is probable that some were removed without being recorded.

355 Kriga 2003b, 469 no. 17.

356 Kriga 2003b, 469 no. 18.

357 *Praktika* 1993, pls. 109b, 113a; Polychronakou-Sgouritsa 2000, 85.

358 *Praktika* 1993, pl. 112c.

359 *Praktika* 1993, pl. 113c; Boulotis in Rougemont – Olivier 1998; Boulotis 2008.

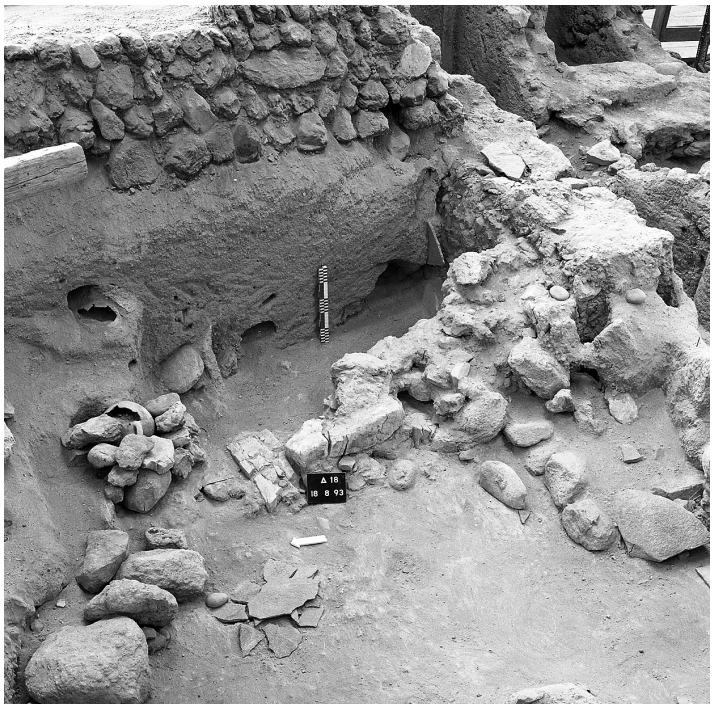


Fig. 44. Delta-East: Room D19, the entrance-main staircase (up right), its adjacent Room D18 (middle back) and a part of Room D21 (middle front) before the excavation of 1993–95; the retaining wall (up left), was a modern addition (Akrotiri Excavations Archives).

Fig. 45. Delta-East: Room D18a, W end, with contents on the floor (Akrotiri Excavations Archives).

Fig. 46. Delta-East: Room D18a, W end. The interior of the *asaminthos*, the outline of which is visible, contained a bronze dagger, a sherd from the clay vessel itself and two fragments of Linear A tablets (Akrotiri Excavations Archives).

suspension ring,[360] and nodule **N74**, found in sieving the soil from that particular microcontext (*Fig. 46*). Two further small fragments of Linear A tablets were recovered in cleaning the area immediately around the *asaminthos*, which comes as no surprise, since the vessel was broken and its interior had spilled outwards.

The rest of the room to the E, which was investigated to a distance of 2.93 m from the W wall, continued to produce medium-sized vessels, such as jugs, amphorae and more tripod cooking pots. Also found were numerous cups of all kinds and sizes in groups — a concentration of 41 cups near the S wall is noteworthy — at times stacked one inside the other and fallen upside-down. A number of organic objects, in particular wooden furniture, was salvaged through their imprints in the ash, which was filled with plaster of Paris and produced casts. The furniture included a table with intricate relief decoration and probable inlaid small ivory rings,[361] and a stool.

In the 1994 season the investigation of D18a was completed;[362] the room had a final length of 4.65 m, width 1.65 m and height 1.85 m. In that year the remaining fill of the room measured only c. 1.7 m to its E wall, but contained a mass of objects which was much more dense and varied than found in the E end of the room. The objects stored in the room

360 *Praktika* 1993, pls. 112d, 113b, termed as a weight; Michailidou (2008a, 29, fig. 20) suggests that the unique shape makes its exact interpretation difficult.

361 *Praktika* 1993, pls. 111, 112a.

362 *Praktika* 1994, 162–63, pls. 89–93.

seem mostly to have been lined up along the S wall; the same variety was observed as in the 1993 season. Among the pots were jugs, amphorae, tripod cooking pots, and cups, of all kinds and sizes; some new varieties were added: pithoi, lamps, cylindrical and conical rhyta, and clay 'offering tables'. A pithos, 'floating' in ash, at a height of 0.55 m from the floor, was found to contain two small wicker baskets. Another pithos, 'floating' c. 1 m from the floor, contained 13 wicker baskets, actual ropes, three bronze hooks, as well as fish remains.[363] Apart from the fishing implements, the pithos also contained a wooden box with ivory inlays. The imprints of two wooden shafts nearby, one measuring 0.95 m and the other 1.12 m, were taken to be oars.[364] At the E end of the room, the pattern of finds changed, with organic containers prevailing, such as baskets, a minimum of two wooden boxes, another wooden stool, and a barrel.[365] The baskets and the boxes contained many objects, which were probably not fortuitous collections, since they presented a number of unifying factors. One basket contained one egg-shaped alabaster rhyton, another rhyton of calcareous material, and a marble chalice.[366] Another contained a box with two bronze handles,[367] which in turn contained metal artefacts: *inter alia* an incense burner, two bowls, a juglet, an open vessel, three small cups and a dagger with three silver nails,[368] and a triton shell. Yet another box contained rather small clay vessels with white-on-red decoration,[369] while a further basket held a pair of bronze fire-tongs.[370] Again, near the E wall of the room, more good quality pottery was lined up. The final count of the room's pottery amounted to 380 clay pots.[371]

ROOM D18B (1994, 1995 EXCAVATION SEASONS)

The investigation of Room D18b was carried out in 1994 and 1995[372] by use of the same original method of vertical *loci*, in order to preserve the ceiling of the ground-level room. The W end of the room, which was, like its sibling 18a, partly destroyed by the torrent waters, was investigated by the normal excavation method (*Fig. 47*).

Room D18b contained a fixed structure, namely a built bench measuring 1.5 m in length, 0.3–0.35 m in width and 0.55 m in height, which fitted onto the N wall and reached all the way to the E wall.[373] This bench is comparable to the ones found in ground-level rooms with mill installations, i.e. Complex Alpha (A)/Western Room 1,[374] West House/Room 3a,[375] and Delta-South/Room D15.[376] A millstone was placed on top of the ruined W

363 Polychronakou-Sgouritsa 2000, 87, figs. 7a–b.
364 Polychronakou-Sgouritsa 2000, 88.
365 Polychronakou-Sgouritsa 2000, 87–88, n. 178, fig. 8.
366 Polychronakou-Sgouritsa 2000, 85, n. 164.
367 One is illustrated in Michailidou 2008a, 24, fig. 15.
368 *Praktika* 1994, pls. 90b–c, 93a–d; Michailidou 2008a, 20–22, figs. 7–10.
369 Polychronakou-Sgouritsa 2000, 84–85, figs. 5, 6.
370 Polychronakou-Sgouritsa 2000, 81, 87, n. 137; Michailidou 2008a, 19, fig. 4; Polychronakou-Sgouritsa 2008, 160, n. 76.
371 Polychronakou-Sgouritsa 2000, 83.
372 No mention of any investigation in Room D18b in *Praktika* 1994. In *Praktika* 1995: 127–30, pls. 60–62a, 63.
373 Polychronakou-Sgouritsa 2000, 77, n. 100; 83, n. 160; 2008, 154.
374 *Thera* II, 30, pl. 29b.
375 Moundrea-Agrafioti 2007, 82–90.
376 *Thera* V, 22–24, pls. 39–42.

Fig. 47. Delta-East: Room D18b on the day the first nodule was found (Akrotiri Excavations Archives).

wall of the room and a large grinder was recovered in its NW corner nearby;[377] inside the room, to the W of the bench, stood an *asaminthos* ('bathtub'), another companion to the fixed mill installations.

Unlike the situation in the adjacent Room D18a, D18b was practically devoid of movable finds: it contained two *asaminthoi*,[378] some cups, five wicker baskets, some wooden furniture and a small basket. The small number of movable finds fits either the picture of a room used for some sort of activity, therefore empty in order to facilitate movement, or a room that had been emptied in order to be renovated after damage caused by an earthquake. However, the first interpretation seems more likely, since no earthquake damage was attested and indeed the room even preserved its ceiling.

Among the finds, the highlight was naturally the batch of clay sealings **N1**–**N73** bearing a variety of seal impressions. The sealings were found at a short distance from the perfectly preserved ceiling, in around the middle of the room. The initial explanation offered for this proximity to the ceiling was that they were either placed in a container suspended from the ceiling, namely a sack or box, or that the water had lifted them this far up, in an otherwise empty room.[379]

377 Polychronakou-Sgouritsa 2008, 156.

378 *Praktika* 1995, 129, pl. 62a; *Ergon* 1995, 52–54, figs. 34, 36; Kriga 2003b, 468 nos. 12 = 7715, 13 = 7733, pls. 14, 15; 479.

379 *Praktika* 1995, 129.

A number of bronze hinges and nails were recovered together with and amidst the clay sealings, a fact that indicates the presence of a wooden box.[380] At least three intact hinges and fragments of more were found among the nodules, implying the existence of more than one box. Two hinges were also found in NPP 64, in definite association with a wooden box, which contained a balance set and the clay nodule **N75**.[381] Whether there were two or three hinges per box, it seems that more than one wooden box was reserved for the impressed clay nodules in D18b. It has been further suggested that the box(es) could have fallen from the upper level and entered the room carried by the alluvial silt, or, alternatively, hung from the ceiling.[382] The exact circumstances in which these boxes were kept will, however, remain elusive, since no traces of wood were detected during the excavation.

Bronze hinges were recovered at the palace of Zakros, apparently in close association with the tablets and sealings from the West Wing of the palace.[383] Platon speaks of three large bronze hinges and nine smaller, deducing either the presence of four wooden boxes, one larger and three smaller, assuming that all of the hinges were collected and that each box needed three hinges; alternatively, he posited seven or more boxes, if all hinges had not been salvaged and collected during the excavation, which he thought was more probable. The hinges from Zakros bear a close resemblance to the hinges found at Akrotiri.[384]

Hinges were also found at Knossos[385] as well as Pylos,[386] both finds of a later date. A suggestion that the bronze hinges in those localities could be indicative of the presence of wooden writing tablets was based on making the case against clay tablets being stored in wooden boxes;[387] it did not, however, take into account the fact that in all the above instances (Zakros, Knossos and Pylos), besides clay tablets, clay sealings were also present and their storage was left unaccounted for.[388]

Commentary: Delta-East, if a separate entity from the rest of Complex Delta (Δ), is the smallest building unit so far excavated at Akrotiri.[389] Its small size could be the reason why it apparently withstood the pre-eruption earthquake, presenting us with the only room

380 Polychronakou-Sgouritsa 2000, 81; 2008, 156.

381 See below, pp. 95–99.

382 Polychronakou-Sgouritsa 2008, 156.

383 Platon – Brice 1975, 26–27, figs. 4–6.

384 A photograph in Platon – Brice 1975, 27, fig. 4. Samples of hinges from different, unspecified areas of the Akrotiri settlement: Michailidou 2008a, 22, fig. 14.

385 At Knossos two bronze looped handles and a bronze elongated clamp with rivet holes in one end were found in the Western Temple Repository, and interpreted by the excavator as belonging to a 'treasure chest' (Evans 1921a, 469, fig. 337). Seven bronze hinges were found in the Room of the Chariot Tablets (Evans 1935b, 668–69; Palmer 1963, 73–74, pl. Va–b, VI, VII). 'Several bronze loop-handles' were found in the Armoury/Arsenal in the vicinity of sealings (Evans 1935b, 668–69; Palmer 1963, 158–59, pl. XXV).

386 At Pylos seven hinges were found in one of the archival rooms (no. 8), associated with a number of tablets and a direct sealing, which sealed a flat object wrapped by a broad leather band (Blegen – Rawson 1966, 98, no. 593.2, figs. 274.1, 275.13–14; Pini *et al.* 1997, 93–94, no. 21A).

387 Mylonas-Shear 1998.

388 The identifiable sealings from the Room of the Chariot Tablets at Knossos were two-hole hanging nodules, flat-based nodules and direct/two-hole hanging nodules (*CMS* II,8 p. 115); the Armoury/Arsenal sealings were single-hole and two-hole hanging nodules, as well as direct/two-hole hanging nodules (*CMS* II,8 p. 127).

389 For a short and informative description of the building unit: Palyvou 2005, 92–95.

that preserved its wall paintings on the walls.[390] The ground-level rooms, i. e. the ones that were not damaged by the torrent, were all in good shape, so good as to have been in no need of repairs after the last pre-eruption earthquake. In addition, it seems that two of these, D2 and D18a, were used for the temporary and hasty storage of undamaged items. In view of the fact that the ground level was not damaged, it is possible that part of the contents of these two rooms originated in rooms on the first floor,[391] which were probably in need of repair. That the first-floor rooms were damaged is further shown by the fact that the auxiliary staircase of the unit[392] was out of use, being turned into another temporary storeroom: it was evident that unimpeded access to the first floor was no longer required.

In order to access the building unit, one would enter from the main door to the E, which opened onto the Square of the Double Horns (*Fig. 43*). The door led to a vestibule/corridor D19, which also housed the main staircase. For access to the ground level, one would have had to pass under the N flight of stairs and enter into D21, a large room measuring 3.5 × 4.3 m, situated at the heart of the building, with a low stone platform slightly off-center, which has been interpreted as a central column base.[393] The room also had a large, horizontal window facing a blind alley to the S of the unit. The usefulness of such large windows was that they provided abundant daylight to sizeable rooms such as D21. However, it is interesting that some of these large ground-floor windows are found in rooms that had probable trade functions.[394] The main reason for this interpretation is that the contents of these large-windowed rooms would normally point to storage; however, storerooms best avoid exposure to the natural elements and do not require increased lighting conditions, large windows would therefore be a clear disadvantage.

Through Room D21 one had access to all the remaining rooms of the lower level, namely D2 to its W and D18, both (a) and (b), to its E. Access to the upper floor was either through the S flight of stairs of the main staircase D19, or through the auxiliary staircase at the N part of the building unit. Access to Rooms D18a and D18b, as well as D2, was therefore not immediately available upon entering the building. The upper floor of the unit was mostly destroyed by the torrent. However, we know that above the ground floor of D18 there was

390 And one of the few ground level rooms with figurative wall paintings; another instance was detected but not excavated in the so-called Kitchen, a ground-floor room in Building Eta (H), where again the main motif appears to have been lilies (*Thera* II, 28–29, pls. 27b, 30a; V, 15–16, pl. 14; Doumas 1992, 184–85; Vlachopoulos 2007, 128). See also pp. 48–49.

391 Suggested in Polychronakou-Sgouritsa 2000, 88.

392 Marinatos first interpreted the narrow space flanking the N wall of Room D2 as a cupboard, and subsequently as the 'treasury of the Fresco of the Lilies shrine' (*Thera* IV, 24, pl. 40; VI, 12–13, pl. 13a; VII, 13, pl. 12); Palyvou (2005, 93–95, fig. 126) interpreted it as an auxiliary staircase.

393 Palyvou (1999, 238) describes the platform as a flagstone protruding some few centimetres from the floor and representing in all likelihood a base for a wooden column; in a subsequent publication (2005, 92) she also provides the dimensions of the platform as 0.6 × 0.7 m and interprets it again as a column base rejecting an alternative explanation as a hearth. The dimensions of Room D21 appear to justify the column base hypothesis.

394 Large horizontal windows facing the street are found in Rooms A1, A2 and D16, all thought to be rooms that facilitated trading activities. They are also encountered at the House of the Anchor and the Sunken House which are not excavated (this latter is part of the Western Quarters, one of the building units of Complex Alpha (A): Moschou – Karnava forthcoming); see also pp. 8–13. More are attested in Xeste 3 (Palyvou 1999, 383–86; 2005, 148–49: Type C, Horizontal Windows). The above instances are all ground level rooms, but this type of window is also found in upper level rooms. For the function of rooms as trading spots, see Doumas 1983, 51; in response to Koehl 1990, 362; also, Chapter 1, pp. 33–38.

a large room with a central column, which had a *polyparathyron* (pier-and-window partition) on its E wall,[395] overlooking the Square of the Double Horns. Also, an upper-storey room existed above the ground floor of D2, separated from the rest of the upper floor with a *polythyron* (pier-and-door partition).

The contents of Room D2, the auxiliary staircase, and Room D18a are not necessarily to be considered as belonging originally to the room where they were found. It is possible that some of these objects had in fact been there all along, but amidst the mass of finds, it is impossible to tell which came first and which came last. However, there is no reason to think that the contents of D18b were in any way disturbed: the room was found in good condition, the ceiling was intact, and was apparently still functional, whatever its function was. The presence of a 'bench', the *asaminthoi* and the movable milling equipment, although highly doubtful whether this last was found exactly in its original position, shows that the room, at some point in its history, was probably used for food preparation activities, i. e. it was the 'mill-room' of the building unit. Since no other space on the ground floor offers this kind of evidence, there is no reason to doubt this was its function until the very end — assuming the building was still inhabited until the end.

Nevertheless, sealings found in what appears to have been a food preparation room, and a sealing and Linear A tablets found in a room that was apparently affected by the 'squatters' activities and turned into a makeshift storage room, make little sense in terms of their contexts. One suggestion could be that the sealings were in both cases *in situ*; another, that they had been transferred from elsewhere, as a result of the 'squatters' activities. One would assume — although no arguments can be made either for or against this assumption — that this emptying of damaged rooms and the stacking of objects in others was done separately in each individual building or 'household',[396] i. e. the stacked contents came from within the same building. But a persistent problem, for which no definitive answer has been offered so far, is whether each building unit, such as the four that compose Complex Delta (Δ) and the at least three that compose Complex Alpha (A),[397] can be identified with a 'household'. If such were the case, even if the sealings were not *in situ*, we would have to assume that they had been transferred there from somewhere else within the same building unit, Delta-East. The only thing that is certain is that their provenance is not to be sought in other buildings further to the N, in a scenario that would see them ending up in Delta-East carried by the torrent; had they come from a different building, it would have been a curious coincidence that they all, notably the sealings in D18b and the Linear A tablets together with one other sealing, ended up in Delta-East.

One point also worth considering here is the possibility that the rebuilding activities of the inhabitants and their refurbishment efforts after the last pre-eruption earthquake focused on 'private' buildings, whereas little attention was paid to buildings of 'public' character, such as Xeste 3 and 4. This suggestion is supported by the fact that the spaces surrounding those buildings were not cleared of the debris from the latest pre-eruption damage; Kouretes Street, the main access road to Xeste 4, remained blocked by the ashlar

395 Palyvou 1999, 386–87, pls. 210a, 212; 2005, 93, figs. 127, 128.

396 The notion of a 'household' is poorly explored in Thera. Some research on the matter has been done for Crete (Glowacki – Vogeikoff-Brogan 2011), while some stimulating discussions have been held for the extra-Aegean world (Müller 2015).

397 Moschou – Karnava forthcoming; see also pp. 8–13.

blocks fallen from the building.[398] In this respect Complex Delta (Δ), which presents evidence of clearing/repairs in various parts does not qualify as a 'public' building, at least not in the sense that Xeste 3 is thought to be.

The post-depositional state of the contents of Rooms D18a and D18b also merits a comment. The daybooks describe that these ground-level rooms, situated under the former torrent bed, were found filled with impure volcanic ash, which was interpreted as having filtered in with water from the torrent; it is this fluid ash that is supposed to have lifted the box(es) in D18b to the ceiling level. So, did the water harm the unfired sealings and, if not, why not? The stamped sealings appear not to have been affected: since the dimensions of certain seal impressions, such as those coming from the ring with the chariot scene,[399] can be measured against impressions from the same ring attested on the accidentally fired sealings from Crete, it is verified that they did not lose their original size. Also, the water seems not to have affected unfired clay objects even immediately below the torrent bed, since Linear A tablets and their accompanying nodule **N74** were found in the adjacent D18a,[400] all objects likewise unfired. The limited effect water had on the contents of these rooms is also indicated by the retrieval of unfired clay cylinders, some of which were found in the SW corner of Room D17, further N within the same torrent bed.[401]

It is probable, therefore, that either water never entered these rooms directly, or we have to assume that unfired clay does not get distorted or even dissolve so easily when immersed in water.[402] At this point we have to mention the instance of an unknown number of Minoan clay tablets dissolving immediately after their discovery in the Zakros palace in the 1960s. Due to the sea level rising in eastern Crete during the intevening millennia the palace in Zakros is nowadays practically under sea level, the problem accentuated by natural spring waters spouting at the site; thus, water has to be drained in order for the excavation to proceed. Platon mentions that they had to wait for the midday sun to dry the soil, still there was no way to salvage and collect more than a dozen tablets out of a tablet archive that probably numbered in the hundreds.[403] At Akrotiri, by contrast, the torrent that crossed over this particular part of the settlement had been redirected in 1968,[404] therefore when the sealings were excavated the area had been dry for more than 20 years. Moreover, the tablets and sealings found in different Cretan sites had only been baked accidentally by the fires that destroyed the rooms where they were kept, i. e. not under proper firing conditions; it seems therefore plausible that half-firing results in clay being more friable than not firing at all.

The presence of impressed nodules as well as Linear A tablets has led Boulotis to speak of a small archival deposit, though not suggesting that this would be the only one to be

398 Nikolakopoulou 2003, 571.

399 See further below, pp. 117–20.

400 *Praktika* 1993, 182–83. The tablets were thought at the outset to be of 'white clay, different than the ordinary local clay'. The difference, however, between the colour of the clay tablets and that of local pottery is that the latter was fired, a process which always alters the colour of the clay.

401 Tzachili 1992; 2002–03; 2008.

402 Experimental methods have shown that corrections and erasures are thought to have been a more efficient method of re-using dry clay tablets (Pape *et al.* 2014), rather than making them anew (Sjöquist – Åström 1991, 19–22).

403 Platon – Brice 1975, 30.

404 See above, n. 335.

Fig. 48. Nodules **N13**, **N14** and **N15** found complete (although not intact), tops; scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

expected in the settlement; other buildings could have accommodated other archival deposits.[405] Nonetheless, since there is no way of telling whether the items in D18a were *in situ*, we cannot assign a definite function to this particular room or indeed to any rooms in this building unit. In addition, Rooms D18a and D18b do not constitute the only findspots of nodules in the settlement, since another nodule fragment was found at a different location of the settlement. Doumas initially suggested that the collection of all sealings in the same spot indicates that they no longer functioned as guarantees of security or authenticity;[406] in turn this would exclude the possibility of any association between the sealings and other items found in the room. Whether valid or not, this suggestion however also implies that we are dealing with an archival deposit, regardless of whether or not it was found *in situ*. The characterization of the total of sealings as an archival deposit seems to be the most plausible explanation.

Hallager points to the impressive proportion (88%) of flat-based nodules recovered complete or almost complete on different Cretan sites, 'despite having all been found in levels accompanied by violent destruction'.[407] It is noteworthy that Akrotiri presents us with a similar case. Although the nodules were not subjected to any conflagration — on the contrary, they were preserved in extremely humid conditions — the overwhelming majority are intact (*Fig. 48*). It is evident that even the nodules that were joined together by the conservators had not been broken in antiquity; some were retrieved from the sieve in pieces, because they became friable after coming into the normal (dry) atmospheric conditions. This fact begs the question as to whether or not the documents sealed by flat-based nodules were ever opened. To suppose that all the batches so far found at Zakros, Agia Triada, Knossos, Sklavokambos, Chania, and now Akrotiri, were of nodules just made and/or received, and therefore not opened or discarded, is too much of a coincidence. The repetition of this phenomenon implies that this was the standard condition of all flat-based nodules: either kept unopened or opened with extreme care, so as to preserve the clay nodule in one piece.[408]

405 Boulotis in Rougemont – Olivier 1998, 408; Boulotis 2008, 72.
406 Doumas 2000b, 63–65.
407 Hallager 1996, 136.
408 See also below, The flat-based nodules: the term and the type, pp. 102–07 (on how the flat-based nodules were manufactured), and Discussion, pp. 224–30.

Open Area to the S of Xeste 2 (NPP 64)

NPP 64 was opened in 1999 in the same area as PP 64, about which very little information is included in the 1973 report.[409] When investigation resumed, it was established that the new pillar pit had been dug into an open area during the latest pre-eruption phase, limited only to the E by a wall with N–S orientation.[410] The old pillar had been founded on a layer of debris consisting of soil and stones, which served as the ground surface of the open area. Two complete pots, uncovered during the 1973 investigation, had been left *in situ*. Additional whole pots and various other items were discovered in the new pit in more or less the same levels, showing that more had been removed from the very spot where the Dexion pillar was placed. The new and the old finds simply rested on top of a debris layer, shrouded by thin pumice and sealed over by the layer of thick pumice.

The objects which constituted the immediate context of the sealing were recovered near the SW corner of the new pit, in a space defined on one end by the three-handled pithamphora, and on the other end by a bronze vessel[411] (*Figs. 49, 50*). Near the bronze vessel lay a number of clay pots, namely a cup under the bronze vessel, a jug containing a cup and organic remains, and another cup, as well as various stone objects, among which a probable weight and a vessel.

Further S from the bronze vessel and to the NW of the three-handled pithamphora, two bronze circular pans were recovered, along with their bronze beam and two weights, a stone and a lead disc (*Fig. 51*);[412] traces of wood, having apparently fused with the bronze alloy,[413] were preserved on the curved surfaces of the pans. It was subsequently revealed that the balance set was placed inside a rectangular wooden box, measuring 20 × 10 cm, from which wooden scraps and two bronze hinges were collected.[414] A bronze ring with a nail, probably belonging to the box, was found in its interior.[415] The box also contained another worked stone object, oblong in shape, hard and black — potentially a touchstone[416]— and nodule **N75**. Further S and near the three-handled pithamphora more items were found, namely a stone bead and another stone weight. Finally, a double strainer jug was recovered (*Fig. 52*).[417]

Commentary: The wider context of nodule **N75**, which is an open space presenting us with abundant movable finds in pristine state of preservation, does not appear to be particularly informative at first sight. The same phenomenon, however, that of collecting objects in

409 *Thera* VII, 21, plan B; *Praktika* 1999, 189, fig. 23, pls. 121, 122.

410 See also Chapter 3, for the impressed pithos rim found in nearby NPP 64A (**I2**), pp. 157–60.

411 *Praktika* 1999, pl. 122c–d.

412 The information in Michailidou 2006, 259. The author also proposes an alternate interpretation of the bronze shaft, other than that of a balance beam, based on the evidence of balance sets from the early 20th century: an object for adding dust to the pan for weighing purposes.

413 In archaeological contexts bronze objects help preserve any organic substances that come into contact with them (see a number of instances mentioned in Michailidou 2008b).

414 See the bronze hinges found in relation to the nodules in Room D18b, p. 90.

415 Another ring with nail was found in assocation with one of the wooden boxes in Room D18a (information from the daybook of Room D18a, kept by N. Polychronakou-Sgouritsa). This precludes the interpretation that the ring was part of the balance set.

416 Michailidou 2006, 245.

417 *Praktika* 1999, pl. 122a.

Fig. 49. NPP 64: whole pots *in situ* from the PP as well as the NPP investigation (Akrotiri Excavations Archives, photo by C. Papanikolopoulos; *Praktika* 1999, pl. 121a).

Fig. 50. NPP 64, middle of the W side: a bronze vessel *in situ* (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

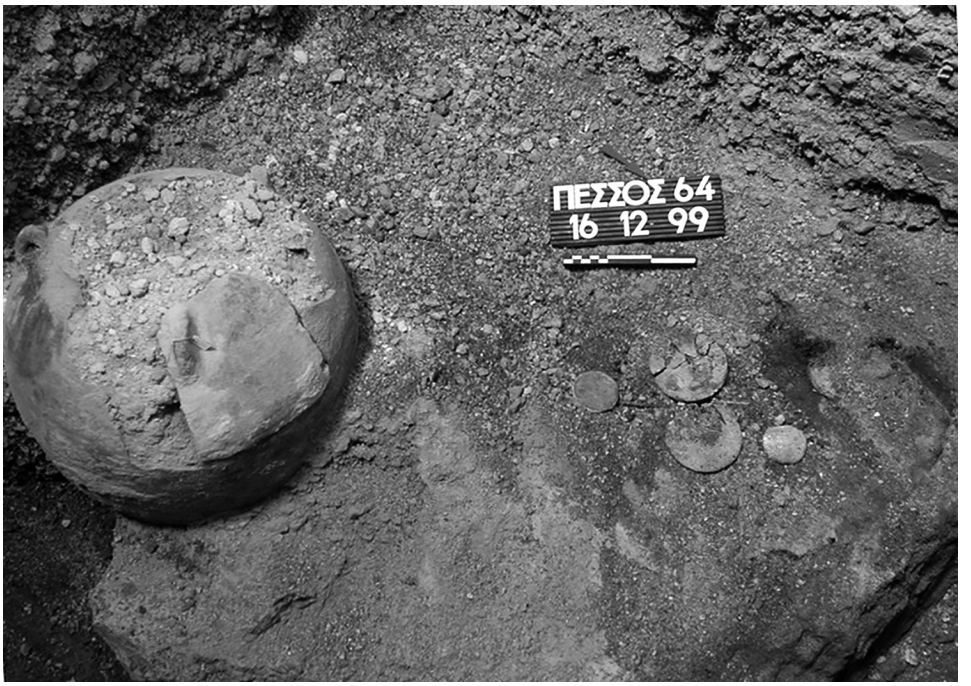


Fig. 51. NPP 64, SW corner: three-handled pithamphora, bronze circular pans with bronze beam, two disc weights of stone and lead, all *in situ* (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

Fig. 52. NPP 64, SW corner: double strainer jug *in situ* (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis; *Praktika* 1999, pl. 121b).

open spaces, such as streets and/or squares, is also encountered elsewhere in the settlement.[418] In all cases, the objects were found on top of thick layers of debris, as if they had been caught in the layer of thin pumice which first fell onto the settlement following the volcanic eruption.[419] The depths at which they were found varied slightly, depending on the inclination of the surfaces — usually uneven — on which they had been placed.

The explanation for this accumulation of intact objects outside buildings can be attributed to the activities of the 'squatters'. The term was first devised by Marinatos,[420] who saw 'squatters' behind the clearing of debris from open spaces to facilitate circulation and architectural interventions, e. g. the blocking of openings, erection of provisional dividing walls, etc. At first he was not clear about assemblages of objects in open spaces: '… where they could form a shelter, inhabitants settled and worked for a short time'. Such items would have been dragged out from the interiors of partly collapsed buildings. The motivation may have been to facilitate structural repairs inside the buildings or to use the objects for everyday activities outside the damaged buildings, or even both. Because some of these open-air assemblages consisted of large numbers of voluminous objects, such as pithoi and *asaminthoi* ('bathtubs'), they must have originated in a nearby building. One cannot, of course, exclude the possibility that objects could come from more than one building. Furthermore, even if items in these piles had originated from a single building, there is no reason to suppose they had all belonged to the same room, i. e. they may have been functionally unrelated. It should also be stressed that the picture is not complete, since these object piles continue beyond the limit of the pits and none has been investigated in its entirety.[421]

The movable items found on top of the debris layer in NPP 64 can, therefore, be integrated into the framework of activities carried out by the inhabitants after the pre-eruption earthquake. They can be seen as having originally belonged to one of the buildings in the vicinity and, at some point, having been pulled out into the middle of the street to be salvaged. From a chronological standpoint, this places them among the equipment used almost until the very end of the life of the settlement.

Although it is impossible to be certain if the items found together with the wooden box were somehow connected with it, the nodule's micro-context is of major interest. As previously mentioned, it was found inside a wooden box, which chiefly contained a balance set and associated paraphernalia, namely disc-shaped weights. One possible explanation is that the nodule was somehow part of the weighing process. Alternatively — since this is another imported nodule — it might point to or verify an action that took place elsewhere, more specifically where the box, balance set and the nodule had originated. In a discussion about the balance set in NPP 64, it has already been suggested that the nodule 'may indi-

418 Nikolakopoulou 2003, 563–65. Areas where items were found in the open: Terrace of the Beds (*Praktika* 1993, 178–80); Area of the Good Vases-NPP 39 (*Praktika* 1975, 229; Nikolakopoulou 2003, 562–63); NPP 1B, NPP 22, NPP 68A, NPP 73, NPP 76, NPP 78, NPP 78A (Nikolakopoulou 2003).

419 Doumas 1978, 781.

420 *Thera* III, 7.

421 See Nikolakopoulou 2003, 557–65 for the various types of 'squatter' activities, especially in open spaces, e. g. the sorting and arrangement of debris-derived construction materials; the organization of working and food preparation areas. In view of the most recent excavations at the site, there seems to be an even stronger case for the activities of individuals or the community after the seismic destruction right before the volcanic eruption, *pace* Treuil 2008, 292–94.

cate the proprietor of the box'.[422] However, explanations that attempt to identify ownership through the nodule fail to take into account the specific nodule type. This is a *nodulus*, which is found in Crete in archival deposits containing sealings and/or tablets.

Another question relates to the purpose of this particular balance set. Seven sets have been found at Akrotiri, among which two came from Room D16 in Delta-South, one from Sector Alpha (A) and another from Room D1a in Delta-West.[423] The NPP 64 pans are medium-sized, with the same dimensions as those from Room D1a; the two found in D16 are the largest and the smallest found so far. The disc-shaped weights from NPP 64 both had a diameter of 4.7 cm, but the stone one weighed 39.5 gr, whereas the lead one 101.7 gr. A pair of not very dissimilar disc weights was retrieved in Xeste 3, one of marble weighing 62.1 gr[424] and another one of lead weighing 52.5 gr. A tentative explanation offered for the Xeste weights is that they were used for weighing saffron, a valuable condiment then and now. This is supported by the iconography in Xeste 3 itself, with its emphasis on the gathering and offering of saffron, as well as the use of the crocus/saffron as decorative motifs. Moreover in the Linear B tablets saffron is weighed in quantities of 3.6 gr to 500 gr.[425] Although this suggestion is plausible enough for the Xeste 3 weights, it cannot be further corroborated by the evidence from NPP 64. The small quantities indicated by the NPP 64 weights would be entirely consistent with handling a precious substance and equally seem to exclude the weighing of large amounts of metal or bulky items such as wool. The presence inside the box of a possible touchstone, which would be used for testing the authenticity of precious metals, in combination with the relatively small balance weights, might well point to the weighing of precious metals, such as gold and silver.

Neopalatial *noduli* in Crete are associated with a variety of contexts, e. g. sealing archives, storerooms and workshops, and occasionally come from findspots identified as private houses.[426] Such diverse circumstances mean that *noduli* cannot be used to interpret the function(s) of the buildings in which they are found. Unfortunately this applies equally to the Akrotiri *nodulus*: it can tell us nothing about the nature of the building where it was once kept inside the wooden box that came to be dragged outdoors following the earthquake.

FUNCTIONAL TRAITS OF THE AKROTIRI NODULES

Various types of clay nodules[427] were used for administrative purposes in Crete during the Minoan Neopalatial period. Their exact functions and roles are matters of scholarly debate, but they undoubtedly testify to the existence of a meticulous, complex and multifaceted administrative system. This is not the place to discuss the history of this Cretan Neopalatial administrative system, which made use of both writing and seals, but based

422 Michailidou 2006, 245, probably following Weingarten 1990b, 19–20, who suggested that *noduli* were meant to identify their carrier.

423 Michailidou 2006, 244–46; 2008b.

424 Room 4, ground level, Ø 4.3 cm.

425 Michailidou 2006, 238–39.

426 Hallager 1996, 129–30. A recent find comes from Gournia (Watrous *et al.* 2015, 441, 449–50, no. 5).

427 See n. 16.

on present knowledge, it was a purely Minoan invention with no parallels in neighbouring civilizations;[428] ties to the preceding Minoan Protopalatial administrative system(s) are obscure.[429]

To introduce the reader to matters pertaining to typology, Minoan Neopalatial clay sealings — i. e. clay nodules bearing seal impressions and also occasionally incised Linear A inscriptions — can be grouped in three generic categories. The first category comprises clay nodules suspended on cords, i. e. the so-called hanging nodules, which exhibit either one hole or two on opposite sides, from which a cord exited. In the second category the nodules bear the imprint of an object onto which they had been attached while the clay was still moist; these are the so-called flat-based nodules and the direct nodules. The third category includes nodules that were never attached to anything else, whether an object or a cord: the so-called *noduli* and roundels.[430]

The clay sealings retrieved at Akrotiri attest, surprisingly enough, to all these categories and to the overwhelming majority of their subcategories, with the sole exception of roundels.[431] The 'surprise' is twofold. Firstly, in the scholarly literature there has been an assumption — so far unproven[432] — that certain Neopalatial sealings were dispatched from one site to another. Secondly, this notion of 'travelling' nodules was thought to pertain chiefly to flat-based nodules and, with seemingly less certainty, to other sealing varieties. While flat-based nodules constitute the overwhelming majority of sealings found at Akrotiri, it is noteworthy that other types are also represented, if only with a single specimen each. Out of the 73 sealings from Room D18b that are sufficiently large and well enough preserved to identify their type, **N1**–**N68** are clearly flat-based nodules (*Figs. 49, 54*). Also represented are a single-hole hanging nodule, **N69**, with an impression unique among the D18b nodules, and a two-hole hanging nodule, **N70**, which is incomplete and does not preserve any traces of its seal impression (*Figs. 57, 58*). The impressed nodule **N74** from D18a, found together with the Linear A tablets, is a direct sealing (*Figs. 53, 59*); on its reverse is the imprint of a circular object wrapped with a cord against which the nodule had been pressed. Finally, the impressed nodule **N75** retrieved from an open area to the S of Xeste 2 can be identified as a *nodulus*, a sealing that was never attached to anything else (*Fig. 61*).

Table 2 sets out various terms that are used in the literature for the nodule types encountered in Akrotiri in English, French and German. In the present study the terms that were introduced by Hallager were chosen. Not all of them are accurate, but since they have been established in the literature they are being overtaken here as such in order to avoid more confusion regarding the terminology used for Aegean sealings by suggesting new terms. Flat-based nodules, for example, constitute a specific and well-defined type but go by various names. The term 'flat-based', employed here, is the most commonly-used albeit it is as inaccurate as the German term *Päckchenplomben*. These nodules are in fact a kind of direct sealing, i. e. one that preserves on one of its sides the imprint of the object to which it was

428 For a more detailed discussion, see Concluding Remarks, pp. 231–36.

429 The historical framework, allowing for differences of opinion in historical interpretations and the evidence from more recent finds, is nicely laid out in Weingarten 1990a; the complicated Protopalatial situation is summed up in Krzyszkowska 2005a, 98–118.

430 Hallager 1996, 19–38, for the full array of Minoan administrative documents (incised and/or stamped).

431 Karnava forthcoming b. There is no way of telling whether or not the absence of roundels is accidental.

432 The cautionary tales in Krzyszkowska 2005a, 188–92.

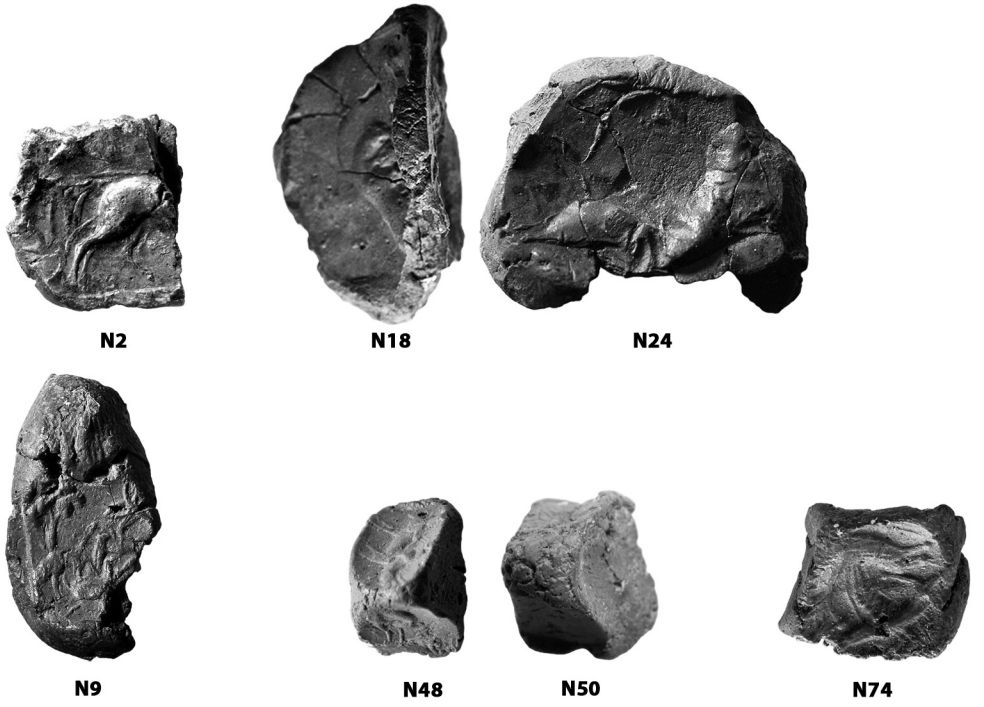


Fig. 53. Some flat-based Akrotiri nodules, all from Room D18b except for **N74**, a direct sealing from Room D18a. **N18** and **N24** are among the largest in size, **N48** and **N50** are among the smallest in size. All four attest to the combination of two seal impressions each; **N2** and **N9** bear one seal impression each; scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

Weingarten	Hallager	Pini	*CMS*	French Literature
Classes I–V; flat-based nodule; document sealing	flat-based nodule	parcel sealing; leather sealing	*Päckchenplombe*	*scellé; pastille*
object sealing: molar	direct sealing	molar	*Stöpselplombe*	*scellé*
nodulus (I)	*nodulus:* dome-shaped	disc-shaped/3-finger/2-finger *nodulus*	*Nodulus*	*boulette*
Class VI	two-hole hanging nodule	around string nodule	*Schnurplombe*	*pendule*
Classes VII–XI	single-hole hanging nodule	pendant	*Schnurendplombe*	*pendule*

Table 2. Cretan Neopalatial clay sealing types attested at Akrotiri and their nomenclature; the shaded terms are the ones used in the present study. After Weingarten 1986a; 1988; Hallager 1996; Pini 1990; *CMS*; Chapouthier 1930; Poursat in Poursat *et al.* 1978; *CHIC*.

attached.[433] Direct sealings — known principally from the sizeable Protopalatial deposits at Phaistos and Monastiraki — all but disappear in the Neopalatial period: our flat-based nodules are among the few examples of clay nodules that were fastened to an actual object and, from what it seems, a portable one.

In the following pages the flat-based nodules are discussed extensively, since they represent the majority of the sealings retrieved at Akrotiri; the discussion includes description and categorization of the nodules found at Akrotiri and comparisons with relevant finds in Crete. The same follows for the single-hole hanging nodule, the two-hole hanging nodule, the direct sealing and the *nodulus*.

The Flat-Based Nodules

THE TYPE

Fundamental to understanding the function and importance of the Akrotiri impressed nodules is what the numerous flat-based nodules were meant to seal. The imprints preserved on the undersides of the nodules show that the clay virtually surrounded a rather thin and relatively flat object with a smooth, roughly even surface, which was folded over and held together by a string. We may also infer that the object was pliable, since in some instances strings pulled taut had made the once-flat surface undulating.[434] The imprints point to an organic object, tentatively suggested as papyrus, palm-leaf or leather by researchers, when specimens were first found at the beginning of the 20th century. Papyrus and palm-leaves have very distinctive imprints,[435] which are not attested in any of the flat-based nodules; the smooth surface of the object suggests that the sealed object was made of leather. Opinions vary only as to whether we are dealing with small parcels,[436] or a folded sheet — always of leather. Folded sheets of leather, sealed with clay and impressed with seals bring to mind pieces of parchment, i. e. leather prepared as a writing surface;[437] the small size of some of these objects, less than 1 × 1 cm, excludes the possibility that the leather, presumably an early form of parchment, was anything other than folded.

Hallager describes clearly the process by which such clay nodules were created: 'The principle of the flat-based nodule is that a tiny folded piece of worked leather — or parchment — has been wound with a thin string, upon which a small lump of clay has been applied and the thin string further wound around the "parcel" and within the clay lump, the procedure ending with the impression of one or more seals into the clay.'[438] The Akrotiri evidence confirms Hallager's description of the procedure followed to make flat-based

433 Direct nodules are not a unified category of nodules. For the varieties, see Hallager 1996, 34–35, 201.

434 It is in this respect that the term 'flat-based' nodule is imprecise: the only category of Minoan administrative documents that actually have one flat side, created by pressing the nodule against a flat, hard surface, are the Protopalatial crescent-shaped nodules (for a succinct description, see Hallager 1996, 34).

435 Clear papyrus imprints are attested on the back of Hellenistic sealings from Kallipolis in Aetolia (Themelis 1979, 263, fig. 21).

436 Pini 1983, 560.

437 Pini 1983, 562, n. 16; Weingarten 1983a, with a lengthy discussion on the recognition of the material involved.

438 Hallager 1996, 135; in accordance: Müller in *CMS* II,7 p. 271.

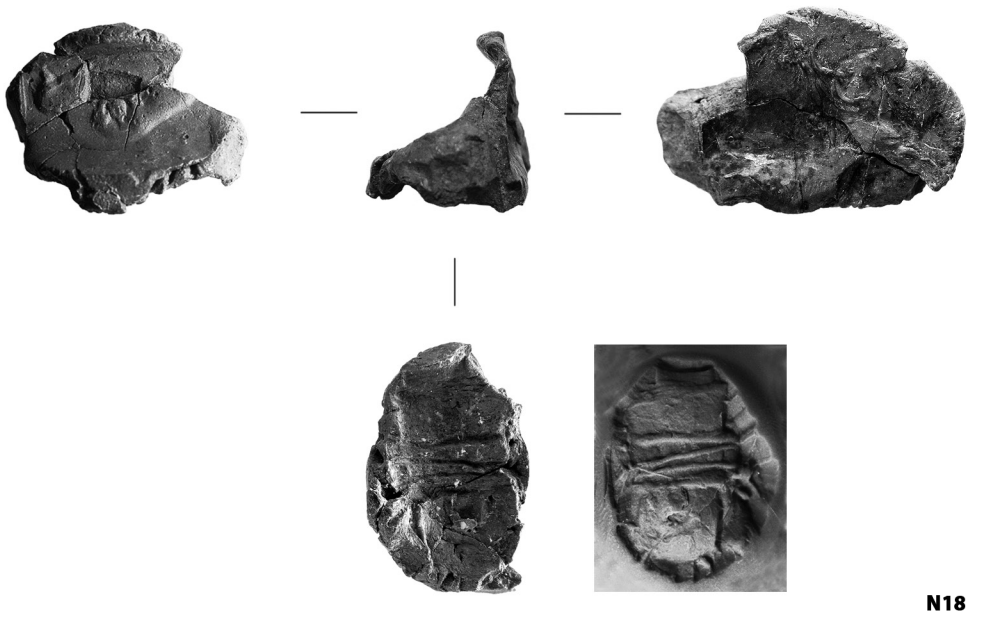


Fig. 54. Flat-based nodule **N18**. Centre: section; upper right: seal impression (*CMS* V Suppl. 3 no. 392); upper left: seal impression (*CMS* V Suppl. 3 no. 393); lower right: (modern) cast of the sealed object; lower middle: imprint of the sealed object, as left on the clay; scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

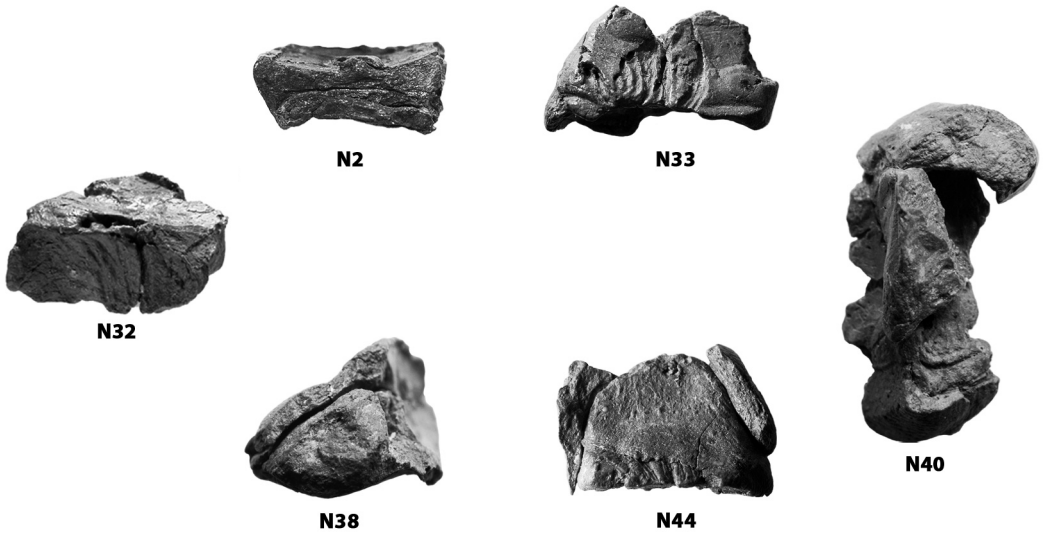


Fig. 55. Flat-based nodules and manufacturing sequence: **N32**, with string exits from inside the clay (3/4 view); **N2**, one-seal flat-based nodule with layers of clay (section); **N38**, two-seal flat-based nodule with layers of clay (section); **N33**, two-seal flat-based nodule with layers of clay (side); **N44**, two-seal flat-based nodule with layers of clay (side); **N40**, two-seal flat-based nodule with layers of clay (top); scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

nodules (*Fig. 54*). Traces of the strings are preserved on one side, the one we assume was the underside, of all the flat-based nodules from Room D18b.

In addition, string holes are not only imprinted on the nodules' underside, but they exit from inside the clay (*Fig. 55:* **N32**). This shows that the string was first wound around the folded leather a number of times, then a layer of clay was applied on top of it, and the string was repeatedly wound around the folded leather together with that first layer of clay. That the clay was placed on top of the folded leather in layers is also evident in the section of the one-seal flat-based nodule **N2**, as well as that of the two-seal flat-based nodule **N38**, where the first clay layer appears to have taken already the shape of a gable (*Fig. 55*). The final layer of clay would receive the seal impression, apparently placed atop the nodule after tying had been completed and probably after the clay had somewhat dried out (*Fig. 55:* **N33**); consequently the various clay layers remained distinct and had not melded together (*Fig. 55:* **N2**, **N38**, **N44**, **N40**). Some nodules even attest to three superimposed layers of clay (*Fig. 55:* **N44**, **N40**). In these cases the first was placed atop the folded leather; then, when these had been tied together, a second gable-shaped layer of clay was added; and finally a third layer covered the whole nodule and received two seal impressions on either side of the 'gable'.

Last but not least, an important technical observation should be stressed: the Akrotiri evidence shows that the clay was not only meant to be placed on top of the folded leather but also to be wrapped around its four sides, sometimes even reaching as far as its underside. Since the overwhelming majority of the Akrotiri flat-based nodules are complete, they also preserve complete imprints of the folded leather on their undersides. Based on Cretan evidence Hallager suggested that some of the flat-based nodules were placed at the edge or the middle of a folded piece of parchment much larger than the actual clay nodule.[439] Such a suggestion has been however disproven through modern experiments.[440] Moreover, there is no corroboration for it among the Akrotiri flat-based nodules. While some fragmentary specimens do not preserve the imprint of the whole folded piece of leather, it is impossible to determine if it had actually been larger than the clay sealing, or if the fragmentary condition of the latter is in itself to blame.

What is, however, evident is that the clay nodules were fashioned in such a way as to ensure that the sealing and folded piece of leather were held together once the clay had dried completely. Hence the binding of the piece of leather with string and formation of the nodule were done simultaneously; this probably also explains why the clay covered the sides of the folded piece of leather as well. Since the pieces of leather with the stamped clay nodules on top would travel, they probably had to keep firmly together.

TERMINOLOGY AND SUBTYPES OF FLAT-BASED NODULES IN PREVIOUS LITERATURE

The term 'flat-based' nodule, which is used in the present study, was first devised by Weingarten,[441] who later opted for 'document sealing'.[442] Weingarten was the first to study in detail the diverse types of nodules in Minoan Crete, beginning with Neopalatial sealings

439 Hallager 1996, 137–45, with visual reconstruction in figs. 51 and 53.
440 *CMS* II,6 pp. 355–56, n. 28; Krzyszkowska 2005a, 156.
441 Weingarten 1983b, 25–26, with description of Classes I–V.
442 Weingarten 1991, 304.

and, most notably, those of Zakros. She suggested a typology of eleven classes of Neopalatial nodules (Classes I–XI),[443] of which Classes I–V correspond to subtypes of flat-based nodules. Her criteria for arranging the material was primarily the shape of the nodule and secondarily the number of impressions it bore, from one to three. Classes I and II bear two seal impressions each, the former on practically parallel vertical sides, the latter on a gabled-shaped nodule; Class III bears three different seal-impressions; Class IV has a recumbent shape and bears two seal impressions; Class V bears a single seal impression. Her initial interpretation regarding the use of these nodules was that they sealed 'the *strips* [of leather] which tied the documents rather than … the documents themselves'.[444]

Pini, based on his study of the Zakros material, where the nodule *par excellence* was the flat-based nodule, established the general term *Päckchenplombe* (parcel nodule) for this type of impressed nodule.[445] His interpretation, however, differed from that of Weingarten: in his view the imprints indicated small pieces of folded leather or parchment that resembled packets or parcels. Furthermore since the unfolded piece of leather was probably no more than 2–3 × 3–4 cm, and since the folded layers were bound tightly together, these 'packets' did not contain anything; instead the pieces of leather carried short written texts. Pini further divided his parcel nodules into *Plättchenplombe* (two-seal nodule with roughly parallel sides) and *dreiseitiges Prisma* (three-seal prismatic nodule).

In his study of Neopalatial nodule types, Hallager retained the term 'flat-based' nodule.[446] He formulated his own typology, merging Weingarten's classes into two main types: the 'standing' nodule (Weingarten's Classes I–III) where the height was greater than its length; and the 'recumbent' nodule (Weingarten's Classes IV–V) where length was greater than height. Further subdivisions of these types are based on the number of seals used: three-seal, two-seal, one-seal.

In *CMS* II,7 (1998), which published the seal impressions from Kato Zakros, and *CMS* II,6 (1999), where nodules from Agia Triada and other Cretan findspots in central and eastern Crete were published, the appendices discussed nodules and other objects bearing seal impressions.[447] In these, Müller presented a detailed typology of flat-based nodules based primarily on the number of impressions each nodule bore and secondarily on the shape of the nodule, which was in reality created by the number of impressions.[448] His subtypes are: *Päckchenplombe, Horizontalscheibe* (one-seal); *Päckchenplombe, Vertikalscheibe* (two-seal); *Päckchenplombe, Pyramide* (three-seal). In these broad subtypes, variations occur, such as *Horizontalscheibe mit zweitem Abdruck* (with two seal impressions), or *Vertikalscheibe, giebelförmige Variante* (gable-shaped), or *Vertikalscheibe, giebelförmige Variante mit flachem Giebel* (gable-shaped, with flat gable); in these variations, the shape becomes the dominant criterion and the number of seal impressions takes second place. In the recent publication of the seal impressions from the Akrotiri sealings and the first comprehensive treatment of these sealings in *CMS* V Suppl. 3 (2004), it is this typology that appears in the description of the impressed nodules.

443 Weingarten 1986a, 2, table 1.
444 Weingarten 1983a, 12.
445 Pini 1983.
446 Hallager 1996, 22, table 1; 135–58.
447 *CMS* II,7 pp. 271–77; *CMS* II,6 pp. 339–99.
448 *CMS* II,7 pp. 272, 274, table 1; *CMS* II,6 pp. 349–60, 395, table 4.

Ten flat-based nodules from Akrotiri bear the impression of one seal, and 52 of two seals; no three-seal nodules are attested. According to Weingarten's typology, they fall within Classes II and IV (with two impressions) as well as V (one impression); Classes I and III are completely absent. According to Hallager's typology, they fall between standing and recumbent two-seal, whereas the one-seal are naturally recumbent. According to Müller's typology, 10 are *Horizontalscheibe*, and the remaining fall under *Vertikalscheibe*.

The subtypes described above make little sense, apart from imposing a formal taxonomy: nodules from the Akrotiri hoard presenting a number of similar traits, such as the same combination of seal impressions and the exact same clay, waver at times between subtypes. Differences in the shapes of hand-made objects are to be expected, but need we assume that they were actually meaningful? For instance, it seems highly dubious that in a hoard as numerous as that found in Zakros House A, with more than 500 nodules, one could distinguish between nodules based on a straight or triangular profile (Weingarten's Classes I and II respectively) or on the ratio between a nodule's height and length (Hallager's standing and recumbent categories, and Müller's *Horizontalscheibe mit zweitem Abdruck* and *Vertikalscheibe*). It is more probable that the different subtypes represent variations, incomprehensible by us, in the way nodules were made. They could reflect differences in time between the creation of various subtypes; or, as is often suggested, localized administrative habits and rules. They could even represent administrative responsibilities and duties. Unfortunately, although the various subtypes have helped scholars bring some order to this material, they seem to offer little assistance in gaining a deeper understanding of how the system worked.

It has been suggested that 'the person who actually rolled or moulded the clay between his fingers already had in mind the shape of the nodule which would emerge'.[449] It has also been suggested that the determining factor in the final shaping of the flat-based nodule was the size of the piece of leather to be sealed.[450] Both suggestions are significant when combined with the information provided by the Akrotiri material:[451] it seems that the size of the piece of leather did in fact define the size of the nodule, and, in this respect, the person who prepared the clay really did have in mind what (s)he had to do. Nonetheless, the Akrotiri material adds another parameter: while some nodules were placed on small-sized pieces of leather half the size of others, it is also evident that the seals used on the smaller pieces were also of small size. In this case, we have to assume that smaller-sized seals were reserved for smaller-sized leather pieces.

The following examples will help illustrate the relationship between seals, nodule shapes and sizes among the Akrotiri flat-based nodules. A sizeable metal signet ring, with an estimated original bezel size of 3.3 × 2.44 cm, stamped single-handedly the horizontally positioned surface of a one-seal nodule (*Fig. 56*: **N6**): the piece of leather beneath was 2.6 × 1.9 cm. The same ring joined a sizeable stone cushion, of dimensions 2.15 × 1.4–1.5 cm, to impress a large gable-shaped two-seal nodule (*Fig. 56*: **N15**), beneath which the folded piece of leather was 2 × 1.45 cm. Subsequently the same sizeable metal signet ring joined a smaller metal ring, with estimated bezel-size of 1.8 × 1.1 cm, in order to produce a gable-

449 Weingarten 1983b, 25.
450 Krzyszkowska 2005a, 156.
451 See further below, Groups among the Akrotiri flat-based nodules, pp. 200–03.

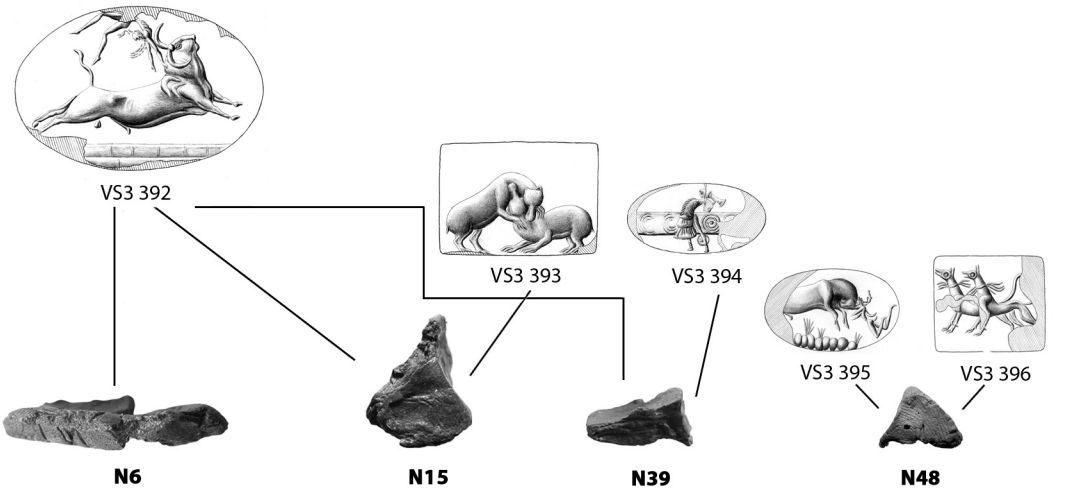


Fig. 56. Sections of nodules **N6**, **N15**, **N39**, **N48** and the seal impressions they bear; scale 1:1 (Akrotiri Excavations Archives/*CMS* Archive).

shaped nodule, albeit considerably shorter than the previous (*Fig. 56*: **N39**). Here the two impressed sides of the 'gable' do not match in size or inclination and the piece of leather was 0.65 × 1.3 cm. Finally, a small metal signet ring, of dimensions 1.7–1.8 × 1.0–1.1 cm, together with a small stone cushion measuring 1.5 × 1 cm produced a small-sized two-seal nodule (*Fig. 56*: **N48**). The size of the piece of leather covered by the first three nodules was practically twice that of the fourth piece of leather, which measured 0.8 × 1.2 cm.

Since the flat-based nodules constitute the majority of nodules retrieved at Akrotiri, they will be examined in more detail than the other nodule types. The history of research, an account of their findspots in Crete and observations on seal use patterns on them are considered separately in Chapter 4.

The Single-Hole Hanging Nodule

Nodule **N69** was retrieved among the hoard of nodules in Room D18b. These belong overwhelmingly to the flat-based type, while only one is a two-hole hanging nodule. **N69** bears the impression of a seal not otherwise attested on any of the Akrotiri sealings (*Fig. 57*).

The name 'single-hole hanging' nodule refers to a basic feature of these nodules, namely that they hung at the edge of a cord, around which the clay was fashioned; the nodules were then stamped and often incised by means of a stylus with Linear A.[452] The imprints retrieved from broken nodules suggest that the now-lost cords had been made of gut, leather or fibres. The imprints also reveal that the end of the cord was knotted, probably in order to prevent the clay from slipping. Hence they offer no clues as to the kind(s) of object(s) associated with single-hole hanging nodules. The specimen from Akrotiri is easily recognizable as belonging to this nodule type, only there is no way of telling whether or not it was incised, since its lower half is missing.

452 Hallager 1996, 37, 161–63; Müller, in *CMS* II,6 pp. 340–46: *Schnurendplomben*.

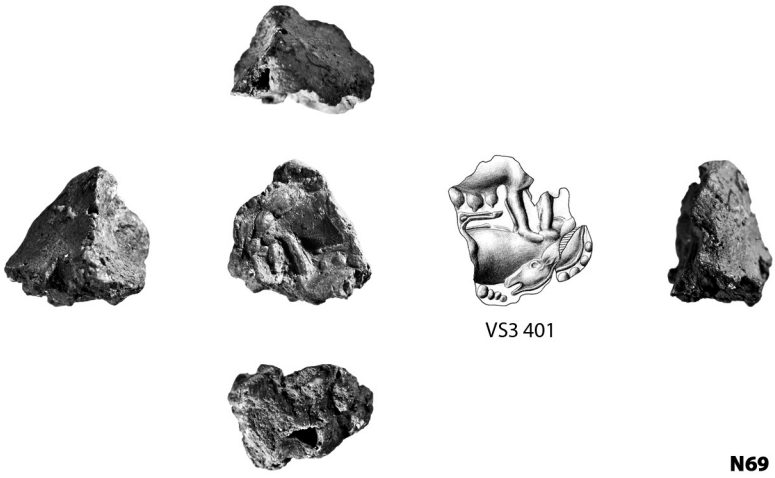


Fig. 57. Single-hole hanging nodule **N69** with the seal impression it bears; scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

Single-hole hanging nodules are the main variety found at Agia Triada with over 900 specimens; approximately 20 specimens each are documented at Knossos[453] and Chania[454] but they are almost virtually absent from Zakros, where only six specimens are found.[455] A distinction in sub-varieties of single-hole hanging nodules is based on the shape of the nodule, which reflects the specific way in which they were made: there are gables, pyramids, conoids, pendants — the last with pyramidical or rounded back.[456] The shape of the unique Akrotiri specimen places it tentatively among the subvariety of pendants with pyramid back, but some caution is reserved on account of its fragmented state. It is a triangular but rather irregular clay lump with three flat sides, on one of which a seal was impressed.[457] Numerous parallels of this particular subvariety are attested at Agia Triada, Knossos and Chania, whereas Zakros has only one near-parallel.

Since nodules of this variety provide no information concerning the objects to which they were attached, if any, various suggestions have been put forward as to their function.

453 *CMS* II,8 where 16 different seals were used for 20 single-hole hanging nodules (nos. 22, 31, 46, 56, 95, 157, 158, 187, 194, 267, 279 × 2, 289 × 2, 492 + 593 × 2, 593 × 2, 604, 687). Nodule with seal impression no. 31 was retrieved from the Arsenal, where bronze hinges from a box were also found (see also n. 385, 388) and two nodules were stamped by two different seals.

454 *CMS* V Suppl. 1A where eight different seals were used for 20 single-hole hanging nodules (nos. 151, 152, 153 × 2, 162 × 3, 167, 168 × 3, 169 × 8, 180). Two of these seals (nos. 162, 169) were also used for stamping roundels at the same site, and one (no. 153) was also used to stamp two specimens of two-hole nodules.

455 *CMS* II,7 where three different seals stamped six single-hole hanging nodules (nos. 23 × 4, 82, 45). The last seal was also used to stamp three different single-hole hanging nodules found in Agia Triada (*CMS* II,6 no. 68). See also, Krzyszkowska 2005a, 158, 184.

456 Krzyszkowska 2005a, 159.

457 Hallager 1996, 162, 'pendant'; Krzyszkowska 2005a, 158–160, 'pendant with pyramid back'; Müller in *CMS* II,6 p. 345, table 1: *mit pyramidenförmiger Rückseite*.

It has been suggested that they basically served an archival role;[458] it has also been proposed that within an archive small containers with high-value goods were secured by the cords from which these nodules hung.[459] However if we take into consideration their high concentration in the same findspot, especially in the instance of Agia Triada, the chances that they were actually fastened to containers decreases.[460] Nevertheless the perception that they functioned as some sort of tags, which conveyed certain information through stamping and the practically standard incising of a Linear A sign, persists in the literature.[461]

The Akrotiri evidence proves, first of all, that single-hole hanging nodules were also travelling nodules, much like the flat-based nodules.[462] This is a valuable piece of information, although there is no way of telling whether it applies to all single-hole hanging nodules, wherever found, i. e. if the Akrotiri evidence should be seen as the rule or the exception. Since it was found along with flat-based nodules in Room D18b, it might have been attached to the container that transported the flat-based nodules or, alternatively, to another, unspecified commodity that came with them. If the latter were true, it is noteworthy that the single-hole nodule still ended up with the flat-based nodules. Regardless of whether or not all single-hole nodules travelled, an archival character is not precluded: since some of them turn up in archival deposits, we can posit that their final destination was the inclusion in an archive. The sheer number of single-hole hanging nodules at Agia Triada argues against any accidental inclusion in those archival deposits which contain only one or two specimens.

The seals used to stamp single-hole hanging nodules were also used to seal other document types, such as roundels and two-hole hanging nodules, found at the same site.[463] The potential to stamp different varieties of nodules most likely highlights flexibility in the administrative duties of seal bearers, and may also demonstrate an increased degree of administrative authority and responsibility. More recent documentation shows that the same seals could be used for single-hole hanging nodules and flat-based nodules dispersed between different sites, since impressions of the same large gold ring with a combat scene are attested on single-hole nodules at Knossos and flat-based nodules found at Agia Triada.[464]

458 Hallager 1996, 197.

459 Weingarten 1987, 34–37; 1991, 304.

460 Hallager 1996, 198–99. Hallager argues that, because of their association with flat-based nodules and Linear A tablets, single-hole hanging nodules could have been attached to written documents, even papyrus, with the advantage that the contents of the document could be accessed without damaging the sealing; there is, however, no way of either proving or disproving such claim.

461 Müller in *CMS* II,6 p. 341.

462 This has already been suggested on account of single-hole hanging nodules found at Knossos but thought to have travelled from Agia Triada because of similarity in shape and clay (Krzyszkowska 2005a, 189). Such a suggestion, however, relies on the (unproven) assumption that the single-hole hanging nodules found at Agia Triada were locally produced.

463 Hallager 1996, 219. See previously n. 454, with the relative evidence coming from Chania.

464 *CMS* II,8 no. 279 on two single-hole hanging nodules from Knossos and *CMS* II,6 no. 15 on five flat-based nodules from Agia Triada, two being dual-stamped with *CMS* II,6 no. 4 (Krzyszkowska 2005a, 190 nos. 368–371). Despite the fact that these impressions are given different numbers in the *CMS* they were actually produced by the same seal.

The Two-Hole Hanging Nodule

Nodule **N70** belonged to the same batch of nodules in Room D18b as the single-hole hanging nodule **N69**, and was thus associated with a clear majority of flat-based nodules (*Fig. 58*). **N70** can be identififed as a two-hole hanging nodule, a variety not attested elsewhere at Akrotiri. Whether it was unique in other respects is impossible to say, since its seal impression is not preserved.

The name 'two-hole hanging' nodule refers to a clay nodule that was shaped around a knotted cord. But unlike single-hole hanging nodules, where the knotted end of a cord was wrapped inside the nodule, in two-hole nodules a cord with a knot ran right through the nodule; the name 'two-hole' refers to the imprints the cord left on opposite sides of these nodules as it entered and exited.[465] The Akrotiri two-hole hanging nodule is fragmentary and estimated to preserve about one-third of its original mass. It was originally gable-shaped and had a single seal impression, now missing; the nodule also lacks half of its reverse. Since it bore no seal impression, the nodule was omitted from the nodules published in *CMS* V Suppl. 3. The present author had registered it in the excavation inventory book, but was unaware of what it was until comparable specimens were examined in the Herakleion Museum. Its shape and cord impressions identify it without a shred of doubt as a two-hole hanging nodule.[466]

This nodule variety is not often found in LM IB archival deposits in Crete but, whatever its function, it was seemingly later inherited by the Mycenaean administration, where it became the prevailing nodule shape[467] — unlike the single-hole hanging nodule that disappears after LM IB. Two-hole hanging nodules have been found in limited numbers at Chania[468] and Agia Triada,[469] but the largest Neopalatial concentration comes from Zakros.[470] The Chania evidence shows a seal used on both single-hole and two-hole hanging nodules.[471] The Zakros evidence is further informative because it shows another overlap in seal use between flat-based nodules and two-hole hanging nodules.[472] We should note here that the stamping of two-hole hanging nodules with two or three different seals is so far peculiar to Zakros. Knossos is a case apart, with more than 700 two-hole hanging nodules

465 Hallager 1996, 36–37, 159–99, where they are treated together with single-hole hanging nodules; Krzyszkowska 2005a, 160–61; Müller in *CMS* II,6 pp. 346–48 (*Schnurplomben*).

466 Confusion seems sometimes to occur in distinguishing between single-hole and two-hole hanging nodules, because there exists a subvariety of single-hole hanging nodules which display a second hole at the opposite end (Hallager 1996, 163); in the present instance the nodule shape leaves no doubt as to its type.

467 Krzyszkowska 2005a, 217–22; Panagiotopoulos 2014, 106–12.

468 Seven specimens of two-hole nodules that date to the LM I period are found at Chania (*CMS* V Suppl. 1A nos. 153 × 2, 155, 181 × 3; V no. 235); two more specimens date to the LM III period (*CMS* V Suppl. 1A nos. 127, 141).

469 Only five specimens (all of them with a question mark due to their fragmentary state): *CMS* II,6 nos. 62, 65, 69, 95, 118.

470 56 specimens are listed in *CMS* II,7.

471 A seal used on two-hole hanging nodules also stamped two single-hole hanging nodules from the same site (*CMS* V Suppl. 1A no. 153).

472 In at least nine instances: *CMS* II,7 no. 71 (one-seal flat-based) and nos. 71-74-124 (three-seal two-hole hanging); the rest are a pair and identical triplettes on flat-based and two-hole hanging nodules: *CMS* II,7 nos. 17 + 38, 72 + 76 + 89, 83 + 179 + 198, 117 + 119 + 151, 129 + 135+ 194, 134 + 148 + 164, 150 + 154 + 229, 187 + 189 + 210.

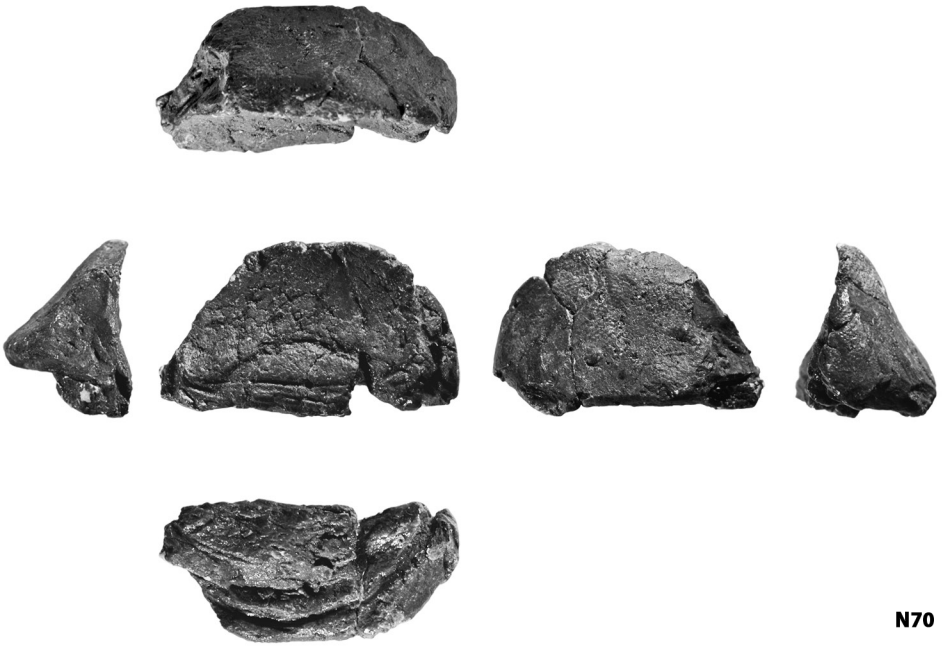


Fig. 58. Two-hole hanging nodule **N70**; scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

attested, although the dating of most examples from the palace is either unknown or disputed. Some 30 two-hole hanging nodules are attributed to the Neopalatial period based on the style of the seal impressions and some examples could even go back to the Protopalatial period on the basis of the same criterion. The fact remains, however, that most two-hole hanging nodules from Knossos belong to the Mycenaean levels.[473]

Two-hole hanging nodules are thought to have functioned as tags for labelling of commodities or their containers, and were subsequently placed in an archive;[474] this interpretation follows the same argument as for single-hole hanging nodules. Nonetheless there must have been fundamental differences in function between the two nodule varieties, since their typological discrepancies appear to be real and consistent. More importantly, single-hole hanging nodules disappear together with the Minoan administration, whereas two-hole hanging nodules proved to be further useful in the context of Mycenaean administration, a fact which implies that the inability to distinguish between the two types of nodules is in the eye of the beholder.

473 Weingarten 1994a, 183–87.

474 Hallager 1996, 159; Müller, *CMS* II,8 p. 53; Krzyszkowska 2005a, 160. The main argument Hallager offers in support of his interpretation is that a two-hole hanging nodule (HMs 1152, now *CMS* II,7 no. 250), was found in the palace together with an amphora. *CMS* II,7 offers, however, conflicting information on the provenance of this nodule, which it designates as coming from House A, except in its introduction (*CMS* II,7 p. XVII), where it is listed as coming from the palace; if HMs 1152 was indeed found in House A, then only two flat-based nodules and two *noduli* survive from the palace of Zakros.

Fig. 59. Direct sealing **N74** from Akrotiri; scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

The Direct Sealing

The direct sealing **N74**, retrieved from inside an *asaminthos* ('bathtub') in the SW corner of Room D18a, is also unique. Apart from being a different kind of nodule than the other Akrotiri nodules, the seal impression on it is also unparalleled, i. e. not attested either among the remaining Akrotiri seal impressions or anywhere among the Cretan evidence. No other nodule was found with it, unlike the numerous specimens found all together in the adjacent room; also, it was accompanied by a number of locally produced Linear A tablets, as if to demonstrate the close relationship between sealings and writing at Akrotiri in a way similar to Crete. Therefore a potential connection between **N74** and the nodules found elsewhere in the settlement cannot be established either on the basis of the seal impression or of the sealing type to which it belongs.

N74 belongs to a broad category of sealings consisting of diverse examples. But each displays on its reverse the imprint of the object against which it had been pressed; hence the term 'direct' seems appropriate for these sealings.[475] Direct sealings, primarily known in the Aegean from EH II onwards and frequently attested in Protopalatial Crete, were attached to knobs and pegs, and evidently served to secure doors or chests.[476] The fact that they are almost absent from Neopalatial sealing deposits has been described as 'a radical change in the way goods and commodities were controlled'.[477]

475 Hallager 1996, 34–35, 201; Müller, in *CMS* II,6 p. 360: *Objektplomben*. As mentioned previously, flat-based nodules do, however, theoretically qualify as direct sealings, since they preserve on their reverses the imprints of the objects to which they were attached. Because these imprints are so distinctive and they were attached specifically to documents, they constitute a category of their own.

476 90% of the Phaistos Protopalatial sealings were direct sealings (Fiandra 1968); Militello 2000; Relaki 2012, 299–313; Weingarten 1990c; 1992; 1994b.

477 Krzyszkowska 2005a, 155.

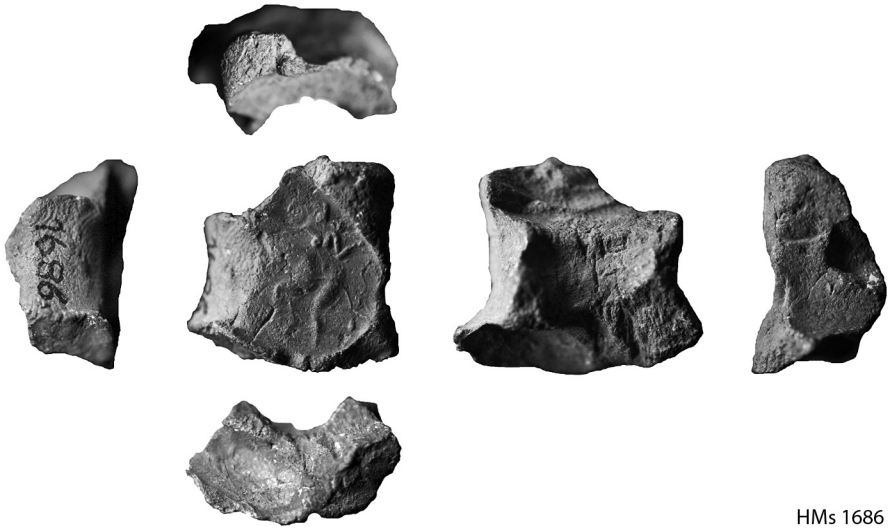


Fig. 60. Direct sealing from Agia Triada (HMs1686 = *CMS* II,6 no. 35); scale 3:2 (Archaeological Museum of Herakleion © Ministry of Culture and Sports/Archaeological Receipts Fund, photos by A. Karnava).

This particular sealing preserves on its reverse the impression of a semi-circular shaft, around which a rather thick string had been wound many times (*Fig. 59*). Since this sealing seems to have travelled from Crete in this state, we assume it had been attached to a movable object; thus the shaft could represent part of a peg or knob belonging to a box.

The overall shape and manner in which **N74** was made is strongly reminiscent of another unique direct sealing retrieved at Agia Triada (*Fig. 60*). There the imprint of the object had the appearance of skin, prompting Müller to suggest that it probably represented a leather container or a leather bag.[478] However, the Akrotiri sealing now provides additional insights, since it was clearly attached with string to a solid shaft or peg. Unfortunately, we cannot identify the material from which the shaft or peg was made, since its surface was almost entirely covered by string.

We could, however, venture to suggest that **N74** may have secured some sort of container, in which the nodules were transported to Akrotiri or which held unspecified goods that accompanied them. The latter option is favoured by the distance which separated **N74**, found in Room D18a, from the hoard of sealings in Room D18b, and also by its proximity to the Linear A tablets; in such case, the tablets could have registered the product(s) associated with/secured by this sealing.

The fact that this direct sealing had travelled, whether together with the other sealings or not, shows that this sealing type could be involved in the movement of sealings and/or products from one place to another. Direct sealings are not always, therefore, indicative of administrative activities being carried out where they were found.

478 *CMS* II,6 no. 35 = HMs 1686; Müller, in *CMS* II,6 p. 360, figs. 5, 6.

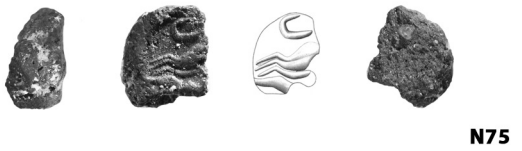


Fig. 61. *Nodulus* **N75** with the seal impression it bears; scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive).

The *Nodulus*

The fragment of the *nodulus* **N75** was retrieved in 1999 in a findspot and archaeological context that had little in common with those of the other Cretan sealings found at Akrotiri. This fragment is yet another unique example at Akrotiri of a particular Neopalatial sealing type. In addition, much like the single-hole hanging nodule and the direct sealing (both unique), this *nodulus* also bears the impression of a seal otherwise unattested at Akrotiri or in Crete (*Fig. 61*).

The *nodulus* is probably the only type of sealing that is attested throughout Minoan administration in its various phases.[479] The realization that *noduli* should be considered a separate category of sealings was slow to come;[480] yet they are clearly recognizable as simple lumps of clay, without any visible means of attachment, which bore one or more seal impressions from different seals. It appears that the number of impressions on the nodule defined its shape: two seal impressions produced the so-called disc *nodulus*,[481] whereas a single impression, as on **N75**, produced the so-called dome *nodulus*.[482] The Akrotiri fragment is too small to judge the original shape definitively, whether conical, pyramidal or rounded on the back, but a rounded oblong shape is most likely.[483] The fact that the Akrotiri *nodulus* was impressed by a metal signet ring conforms to evidence collected for Neopalatial dome-shaped *noduli* found in Crete, where 44% carry impressions of metal rings. In addition, during this period the motifs on these rings were mostly '… animals, with the bull predominant but also boar, lion, agrimi, stag, and dogs'.[484]

As previously described, the micro-context of this sealing — inside a wooden box, together with a balance set and possible weighing equipment — is unprecedented in the Minoan world. It is hard to escape the notion that the *nodulus* was somehow connected to the weighing process; alternatively, it could have indicated an intention or an act that took place where the box originated, such as to authenticate or certify. Some kind of connection between a *nodulus* and the weighing process is not wholly inconceivable, since

479 Krzyszkowska 2005a, 161–63.

480 Weingarten 1986a.

481 The Zakros evidence shows overlaps between impressions on two-seal flat-based nodules and two-seal *noduli* in three instances: *CMS* II,7 nos. 105 + 159, 156 + 227, 162 + 171.

482 Hallager 1996, 121–33.

483 Hallager (1996, 121) suggests that the shape of the *nodulus* was ultimately defined by the way the lump was held and the sort of seal that had been used; in this respect, an oval-shaped ring bezel would have created an oblong dome-shaped *nodulus*.

484 Hallager 1996, 128. A recently recovered *nodulus* from Gournia also shows two bulls *tête-bêche* (head-to-tail) (Watrous *et al.* 2015, 449–50 no. 5).

certain examples at Agia Triada, and also one from Samothrace, bear incised fractional signs.[485] Linear A fractions were meant to denote quantities smaller than a unit[486] and they are indicative of the precision required by and aspired to by Linear A scribes. This is not to say that all *noduli*, with and without fractions, had the same function, since many changes in their typology and sealing patterns can be seen during the hundreds of years they were used; different functions have even been posited for the disc-shaped and the dome-shaped *noduli*.[487]

The interpretation offered for the function and use of these sealings, that they served as tokens of some kind, still remains valid and is the most widely accepted.[488] At Akrotiri, where weighing and perhaps product exchange appears to be the case, the *nodulus* — a piece of clay authenticated by its seal impression — could have served as a receipt, i. e. as proof that goods had changed hands. It is not clear, however, whether the product exchange implied by this issuing of tokens also meant that all *noduli* travelled. Two *noduli* and a third possible one were already attested in a locality outside Crete, namely Samothrace in the northern Aegean,[489] yet the excavator appears to be of the opinion that they were locally manufactured.[490]

THE ICONOGRAPHY: THE HIGHLIGHTS OF MINOAN GLYPTIC

The impressed sealings retrieved at Akrotiri comprise a minimum of 69 specimens, but attest to the use of only 19 different seals (*Fig. 62*).[491] Sixteen different seals had been used to stamp the flat-based nodules in Room D18b,[492] another seal impressed the single-hole hanging nodule in Room D18b,[493] yet another the direct nodule in Room D18a,[494] and a further seal is attested on the *nodulus* from NPP 64.[495]

The seals used were metal rings and stone seals of different shapes and sizes. All are to be seen as Minoan products, overwhelmingly Neopalatial in date. Virtually all were of superb craftsmanship and bore an impressive array of figurative motifs: a chariot scene; bull-related

485 *GORILA* II nos. HT Wa 1021, HT Wa <1021 bis>, HT Wa 1023, HT Wa 1024; Matsas 1995, 240–41, pl. XXXVIIa–c: SA Wa 1; Hallager 1996, 127.

486 Bennett 1950.

487 Hallager 1996, 129–33.

488 The suggestion put forward and distilled over the years: Weingarten 1986a; 1987; 1990b. An extensive discussion also in Hallager 1996, 130–33.

489 Matsas 1991; 1995; *CMS* V Suppl. 1B nos. 321, 327; V Suppl. 3 no. 343.

490 Matsas (2009, 260) suggests that the *noduli* and the roundels were of local clay, as opposed to the direct sealing which was of clay foreign to Samothrace. Despite the fact that it is not clear whether locally reproduced types of distinctly Minoan administrative documents should fall under a Minoan or a minoanizing production, the phenomenon has been described as 'the adoption of Minoan administrative systems' (Girella – Pavúk 2016, 19).

491 The seal impression which became detached from the two-hole hanging nodule could be lurking amongst the fragmentary impressions. If different from the seal impressions attested, then the number of seals used for the production of the Akrotiri sealings would rise to 20.

492 *CMS* V Suppl. 3 nos. 391–400, 403–405; seal impressions on **N10**; **N62**; **N68**.

493 *CMS* V Suppl. 3 no. 401.

494 *CMS* V Suppl. 3 no. 402.

495 Seal impression on **N75**.

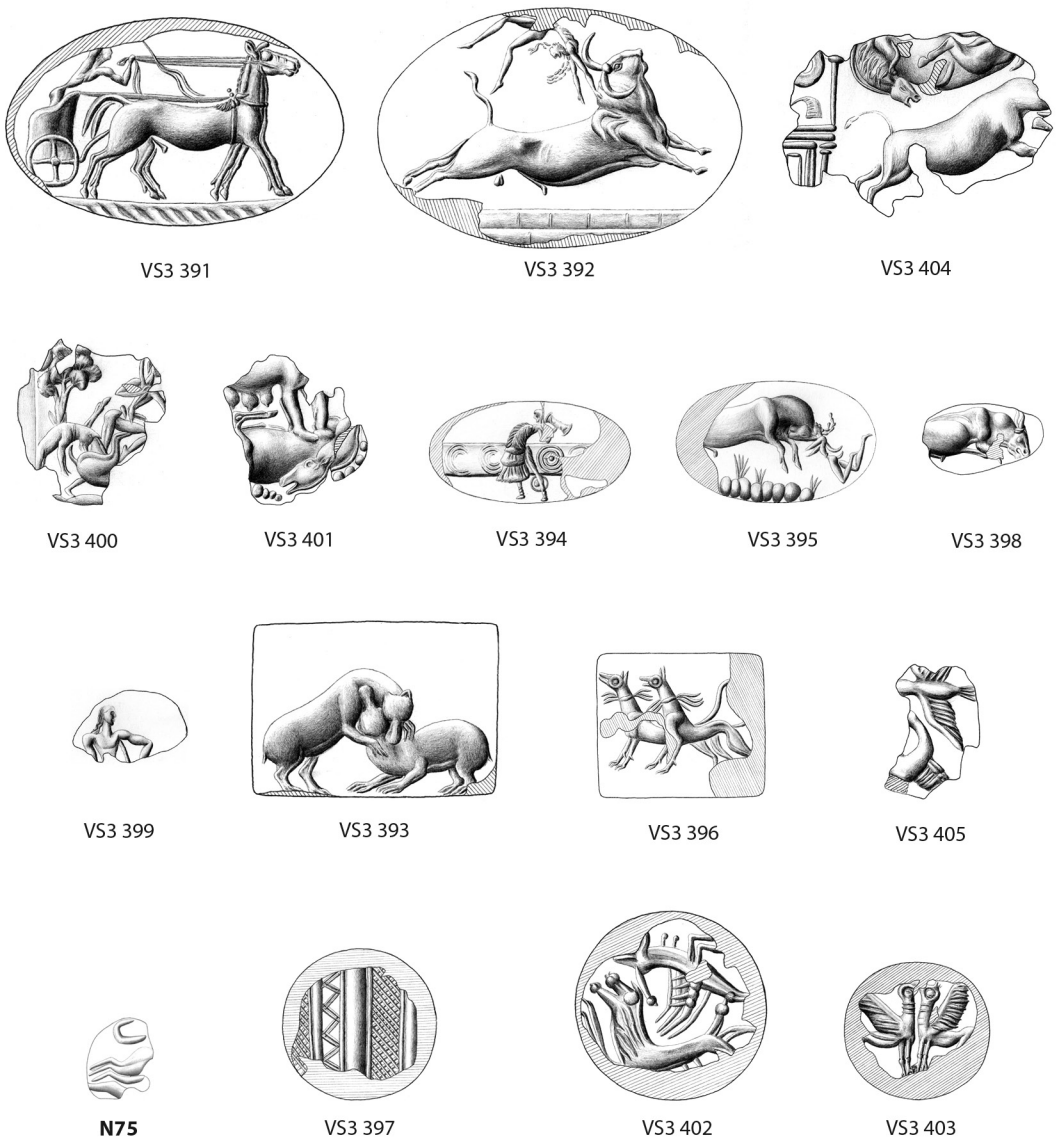


Fig. 62. The array of seal motifs attested on the clay nodules from Rooms D18a–b and NPP 64; scale 3:2 (*CMS* Archive).

images, including bull-leaping; animals and mythical creatures fighting or running. As a matter of fact, there is only one seal with a non-figurative motif, a so-called tectonic motif, datable on stylistic grounds to MM II–III. The fact that the seals were undoubtedly Minoan products reinforces the view that the sealings themselves originated in Crete.

The various motifs considered here are grouped according to theme.[496] A detailed commentary on every aspect of the iconography is, however, beyond the scope of primary pub-

496 Three motifs that appear on fragments too small to allow any statements are omitted: part of an animal's body on **N10**; two animal feet (?) on **N62**; a body part on **N68**.

lication such as this. Since we are dealing with nodules imported from Crete, the motifs have little to do with Theran or Cycladic iconography, and are of greater relevance to the Minoan repertoire. Nevertheless, as will be discussed at the end of this chapter, the seals used to stamp nodules jointly seem to display motifs that are inter-related and inter-dependent. This necessitates both a study of the individual motifs and a broader appreciation of their thematic interconnections.

A Chariot Scene

The impression of a gold ring of original dimensions c. 3 × 1.85 cm depicting a chariot scene is attested on three sealings as the sole impression (*Fig. 63*).[497] A 'box' chariot with a four-spoked wheel and a charioteer mounted in it travels from left to right;[498] two horses draw the chariot with a draught pole that has a triangular traction system.[499] The charioteer, a male figure, does not appear to wear any clothes. He is shown leaning forward intensely, a pose suggestive of speed, holding the reins in his left hand and a whip in his right, with which he spurs on the horses. Curiously the motion of the horses seems fairly sedate — the pose resembles an extended trot — and is rather at odds with the urgency and tension conveyed by the charioteer's stance and use of whip. Great attention is paid to the detailed rendering of the horse's equipment: both a girth and a neck-strap are shown, and the yoke saddle is decorated with tassels; the harness ends in a cheek-strap, on which blinkers are attached. The horses' manes also appear to be braided.

The first representation[500] of a chariot scene in the Bronze Age Aegean occurs on a *nodulus* found in the Eastern Temple Repository of the Knossos palace and shows a charioteer in a wagon pulled by a pair of griffins (*Fig. 64, left*);[501] the date of this deposit is thought not to be very distant from that of the Akrotiri impressions.[502] We see chariot scenes next on stone grave *stelae* from Grave Circle A at Mycenae (Shaft Grave V).[503] These are interpreted as war scenes: in all instances, the charioteer carries a sword or a dagger; in two instances he confronts a person on foot, who also holds a sword; in another instance, a person, clearly a warrior, covered by a figure-of-eight shield is lying under the hooves of the horse.[504] Yet another such scene occurs on a gold ring found in Shaft Grave IV in Grave Circle A:[505] two charioteers, one of which is equipped with bow and arrow, ride in a chariot that curiously lacks a pole to join it to the two horses running in front; the men are out hunting, since they

497 Doumas 2000b, 59, motif A: 'chariot race'; *CMS* V Suppl. 3 no. 391.

498 The chariot would have travelled from right to left on the seal face.

499 The terminology follows Crouwel 1981.

500 A clay model of a wagon from Palaikastro dating to EM III–MM I is the first evidence for wheeled vehicles in the Aegean (Crouwel 1981, 54–56, pl. 49; 2005, 39, pl. IIIa).

501 *CMS* II,8 no. 193. Griffins pulling a chariot also appear on a golden seal ring from Antheia in Messenia, dated on stylistic grounds to LH II–IIIA1 (*CMS* V Suppl. 1B no. 137).

502 Pini (1990, 52) dated the sealings recovered from the Temple Repositories to 'the beginning of the LM period'. He has since lowered their dating to a definite LM I (*CMS* II,8 p. 8). The controversy surrounding the date of these deposits, whether earlier in the Neopalatial period or as late as Pini suggests, does not alter the fact that the sealings found there represent the only known assemblage of sealings assigned between the Akrotiri finds and securely-dated Protopalatial deposits.

503 Karo 1930, 168–72; Crouwel 1981, 59, 119–21, pls. 35–39.

504 Younger 1997, *passim*, where a number of *stelae* with chariot scenes are discussed.

505 Crouwel 1981, 59, 121–22, pl. 10; *CMS* I no. 15.

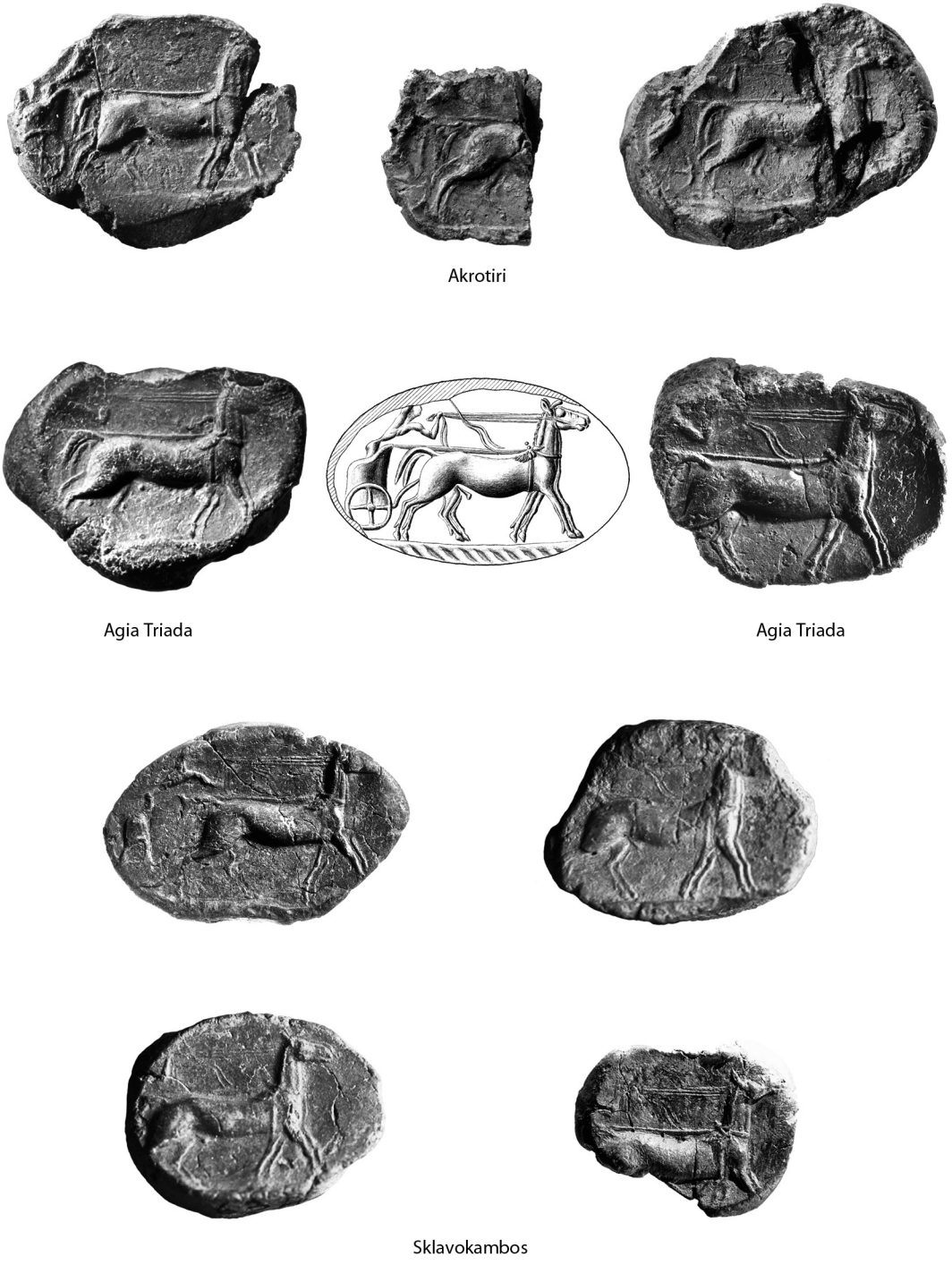


Fig. 63. Seal impression with a chariot scene; attested on nodules **N1**–**N3** from Akrotiri (*CMS* V Suppl. 3 no. 391), two nodules from Agia Triada (HMs 516, 591 = *CMS* II,6 no. 19) and four nodules from Sklavokambos (HMs 632–635 = *CMS* II,6 no. 260); scale 3:2 (Akrotiri Excavations Archives/*CMS* Archive/Archaeological Museum of Herakleion).

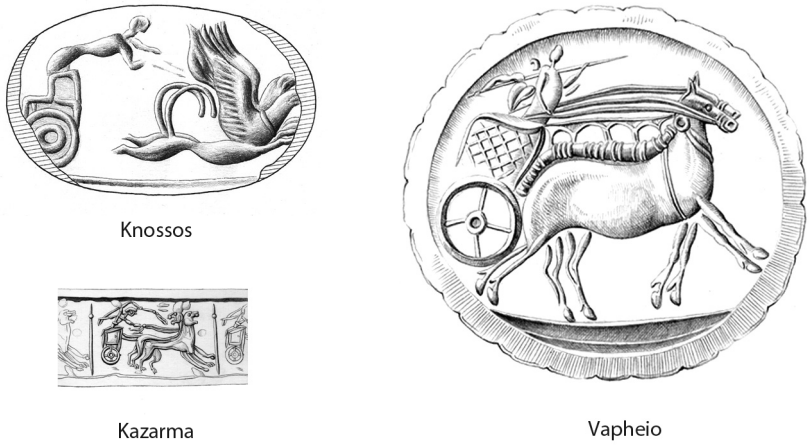


Fig. 64. Seals and seal impressions with chariot motifs: *CMS* II,8 no. 193 (Knossos Temple Repositories); V no. 585 (Kazarma, Argolid); I no. 229 (Vapheio, Lakonia); scale 3:2 (*CMS* Archive).

take aim at a deer. The landscape elements — 'hanging rockwork' and a wavy groundline which turns into the trunk of a stylized tree[506] — suggest open countryside or woodland.

A scene more akin to the Akrotiri impression occurs on a cylinder seal from the tholos tomb at Kazarma in the Argolid that dates to LH IIA. This too shows a single charioteer whipping the pair of draught animals; but here the vehicle is drawn by lions, one with its head turned back (*Fig. 64, middle*).[507] An agate lentoid from the Vapheio tholos, also datable to LB I–II on stylistic grounds, shows a chariot drawn by a pair of horses, driven by a charioteer and carrying a man holding a spear, either a warrior or a huntsman (*Fig. 64, right*).[508] In this representation the perspective is curious: the engraver depicted the triangular traction system in its entirety, which in profile view would normally be hidden behind the animals. Besides the seals discussed here, very few other seals with a chariot scene have been recovered. The most notable among them are a gold signet ring said to be from Aidonia in Korinthia,[509] a carnelian amygdaloid from 'Knossos'[510] and a rare agate ring from north-central Crete.[511]

These depictions, along with the Akrotiri evidence, are reminiscent of a series of chariot scenes mostly on seals and seal impressions in an area extending from Anatolia to Mesopotamia and Egypt in the second millennium BC.[512] Variations of this theme, together with ample textual evidence regarding chariots and horses, confirm the connection of chariot

506 Krzyszkowska 2010, 181, fig. 17.13b.
507 Crouwel 1981, 59, pl. 9; 122–23; *CMS* V no. 585.
508 Crouwel 1981, 59, 123–24, pl. 11; *CMS* I no. 229. A second seal, a carnelian amygdaloid with a chariot scene, was also found in the Vapheio tomb (*CMS* I no. 230).
509 *CMS* V Suppl. 3 no. 244, dated on stylistic grounds to LB I–II.
510 *CMS* VII no. 87, dated on stylistic grounds to LM II–IIIA1.
511 *CMS* VI no. 285, dated on stylistic grounds to LM II–IIIA1. The chariot is drawn by two wild goats.
512 Littauer – Crouwel 1979, 48–98.

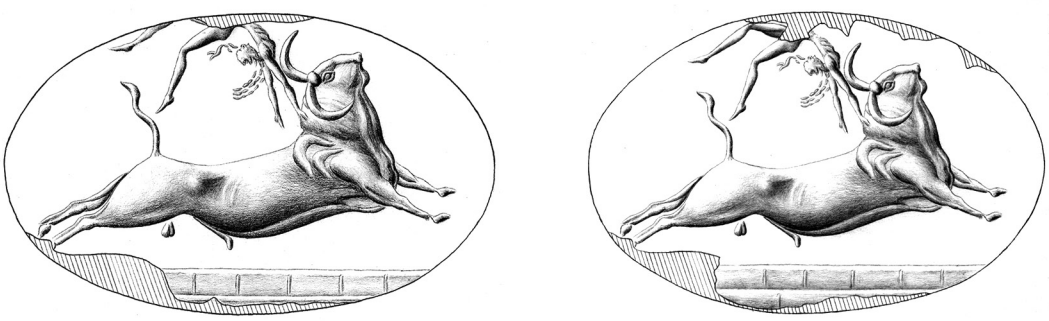
scenes to warfare, hunting and ceremonies. The subject is rendered in much the same fashion in various parts of the ancient world, as attested on seals of early second millennium date, as well as an example from Nuzi in Mesopotamia from the later second millennium;[513] similarities in composition could be due to the circulation of prototypes. Crouwel therefore suggests that the chariot type appearing in the Aegean — as an iconographic motif and in reality — most likely came from the Levant via Crete, from where it was introduced to the Greek mainland.[514] That we are not dealing solely with imported imagery but the introduction of chariots proper is shown by various elements, including idiosyncratic Aegean structural characteristics such as the triangular traction system,[515] which persist in Aegean iconography throughout the LBA.

Impressions apparently coming from one and the same ring as the Akrotiri impressions are attested among the stamped nodules recovered at Agia Triada[516] and Sklavokambos,[517] both sites with extensive destruction layers dating to LM IB (*Fig. 63*).[518] Until the discovery of the Akrotiri sealings, the examples from Agia Triada and Sklavokambos were considered among the earliest representations of chariots in the Minoan-Mycenaean periods. However, the ring that produced the Akrotiri-Agia Triada-Sklavokambos impressions had evidently already been manufactured in LM IA, in a period sometime between the dates of the Knossos Eastern Temple Repository and the Mycenaean Shaft Grave era. In the Akrotiri impression the actual chariot box is clearly preserved and, in addition, the groundline is more distinct than in the Agia Triada and Sklavokambos impressions. The groundline is seemingly created by a slightly concave line with oblique shallow lines.[519] There is nothing in the background to indicate the setting of the scene, be it the natural or urban environment.

Apart from the example of a sealing from the Eastern Temple Repository and the matching set of seal impressions from Akrotiri, Agia Triada, and Sklavokambos that are to be traced back to the same ring, only one other seal with a chariot scene is attested to have stamped a sealing. Its impression occurs on a nodule from Archive Room 8 at Pylos and depicts a charioteer standing in a horse-drawn chariot, in front of which is a man grasping a lion by its throat.[520]

The chariot scenes on the few Minoan seals and the even fewer Minoan and Mycenaean sealings preserved to date offer no clues as to the occasion depicted. The scenes could be connected to a battle, hunting, ritual procession, or an athletic activity such as races.[521] These activities can usually be deduced from specific paraphernalia, such as weapons, bows, or the substitution of griffins for horses; here, however, all accompanying evidence is missing.

513 Littauer – Crouwel 1979, pl. 32.
514 Crouwel 1981, 148–49; updated discussion, Crouwel 2005.
515 Crouwel 1981, 62–63, 90–96.
516 HMs 516, 591 = *CMS* II,6 no. 19.
517 HMs 632–635 = *CMS* II,6 no. 260.
518 Krzyszkowska 2005a, 190, no. 370.
519 It is possible that this is not an actual representation of the terrain, but a framing border with ornamental wavy lines, thus copying a wall painting (Blakolmer 2010, 92–96).
520 *CMS* I no. 302; Pini *et al.* 1997, 13, pl. 8, no. 22.
521 Crouwel 1981, 145.



VS3 392

Fig. 65. Seal impression with a bull-leaping motif (left: *CMS* V Suppl. 3 no. 392; right: drawing adapted by A. Karnava).

Bull/Bovine Iconography

A large number of sealings from the D18b hoard carry motifs depicting bovines, in most cases bulls. Two different bull-leaping scenes are attested,[522] one in which the leaper jumps over the bull[523] and a second in which the leaper or catcher is in front of the bull, grabbing or trying to grab the animal by its horns (*Fig. 65*).[524] A bull appears in a *couchant* pose[525] and a bovine comes under attack by a lioness (*Figs. 68, 69*);[526] lastly, two bovines appear next to a building (*Fig. 70*).[527] The total specimens bearing one or the other of these five motifs are 53 and make up nearly 77% of the nodules found at Akrotiri.

bull-leaping scene: a leaper somersaulting over a bull

The first of the two bull-leaping scenes comes from the largest seal face attested among the Akrotiri sealings with original dimensions c. 3.3 × 2.44 cm; the ring was used for the stamping of at least 41 different sealings either as the sole operator, or together with two other seals in alternate pairs, which makes it the most frequently used seal among the Akrotiri sealings.[528] In view of new nodule joins that materialized after their inclusion in *CMS* V Suppl. 3,[529] the scene can now be further completed and enhanced.[530] The new joins also increase the original seal face size from 3.2 × 2.2 cm to 3.3 × 2.44 cm (*Fig. 65*).

The impression shows a bull in flying gallop from left-to-right in a paved, open area;[531] the animal's sex is clearly indicated and one of its horns is twisted towards the ground, a

522 On bull-leaping in seal iconography: Evans 1921b; Younger 1976; 1995. More broadly, Shapland 2013.
523 *CMS* V Suppl. 3 no. 392.
524 *CMS* V Suppl. 3 no. 395.
525 *CMS* V Suppl. 3 no. 398.
526 *CMS* V Suppl. 3 no. 401.
527 *CMS* V Suppl. 3 no. 404.
528 Doumas 2000b, 59, motif B: 'bull-leaping'; *CMS* V Suppl. 3 no. 392.
529 See above, pp. 82–83.
530 **N15** augmented the groundline, **N24** augmented the bull-leaper's body.
531 The bull would run from right to left on the seal face.

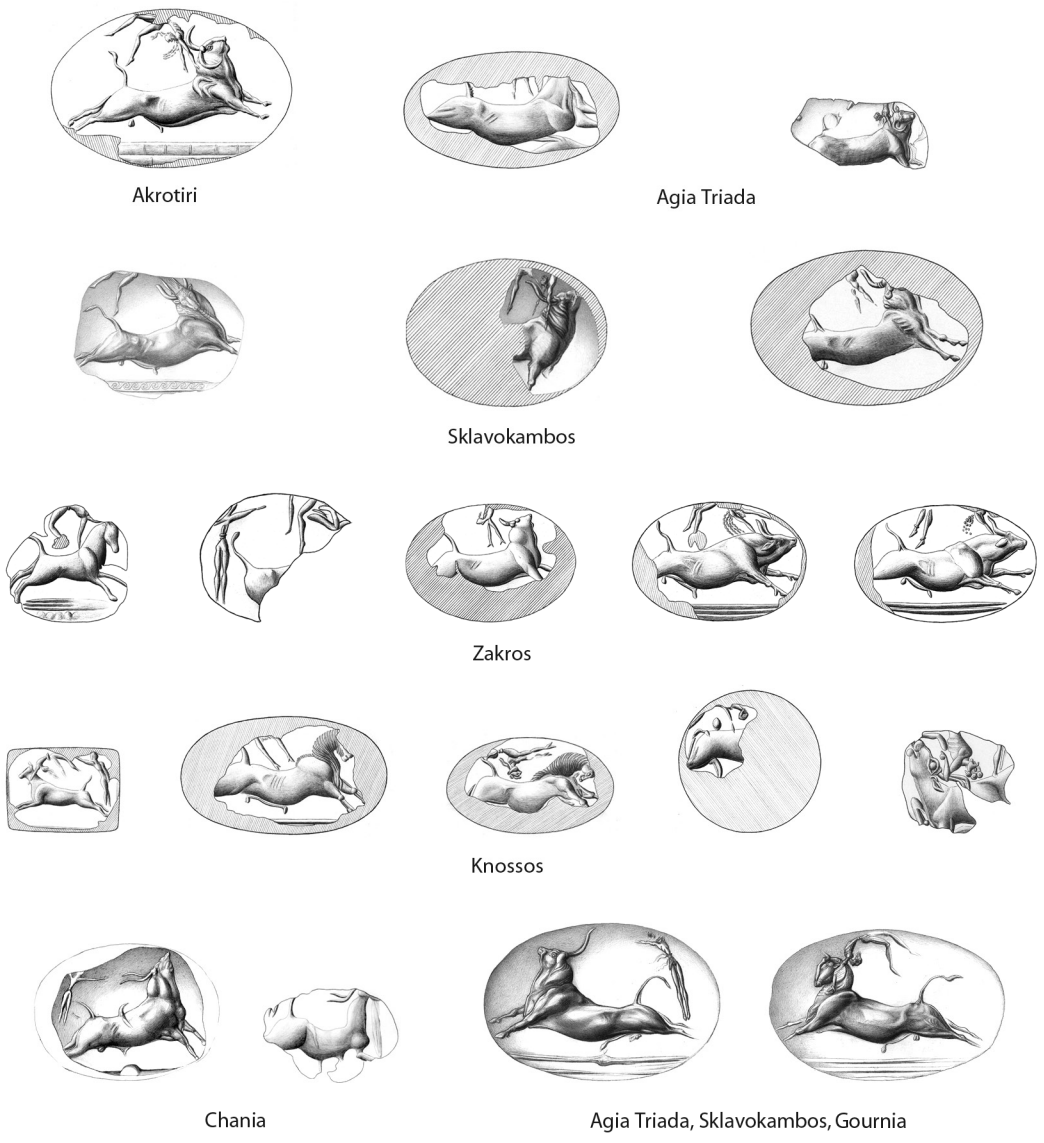


Fig. 66. Different seal impressions with bull-leaping motifs (from top left: *CMS* V Suppl. 3 no. 392; II,6 nos. 41, 42, 256, 257, 258; II,7 nos. 34, 35, 36, 37, 38; II,8 nos. 221, 222, 223, 224, 225; *CMS* V Suppl. 1A nos. 171, 172; II,6 nos. 43/161/259/II,7 no. 39; II,6 nos. 44/162/255); scale 1:1 (*CMS* Archive).

peculiarity uniquely attested on this seal. A bull-leaper has already executed a somersault over a bull and is about to land on his feet behind the animal. The leaper has long braids, a characteristic he shares with bull-leapers on other seal impressions of the same theme, and distinctive hair locks that spring from the top of his head, but the part of the sealing where his loincloth would be is missing. Parallels for this hairstyle can be seen in Akrotiri on the Boxing Boys Fresco from Building Beta (B).[532] In this fresco, this hairstyle is associated

532 Doumas 1992, 79–81.

with young boys who have presumably entered puberty[533] and could also be indicative of a person going through a rite of passage.[534] The miniature size of the bull-leaper's head does not, however, allow us to say whether or not the leaper has a shaven head. If not, then the closest parallels for his hairstyle can be seen in bull-leaping scenes attested in wall paintings, as in the Taureador Frescoes from Knossos.[535] No supplementary motifs are attested on the seal impression.

Surviving seals with bull-leaping scenes derive from contexts that date to the Mycenaean period.[536] Recently a gold ring with a bull-leaping motif was retrieved from a LH IIA tomb in Pylos, Messenia.[537] But the motif is primarily known from numerous seal impressions, where it is rendered in a comparable manner; they are attested at Agia Triada,[538] Gournia,[539] Sklavokambos,[540] Zakros, Knossos,[541] and Chania (*Fig. 66*).[542] Its repetition lies at the heart of discussions concerning the so-called replica rings and look-alike seals.[543] More interesting still is the fact that two different seals which share this theme were responsible for the production of multiple sealings that ended up at different Cretan sites, namely Agia Triada, Sklavokambos, Zakros and Gournia (*Fig. 66, down*).[544]

The different versions of this theme share a number of characteristics. The scene always contains the same elements: the running bull, a bull-leaper or two, and an indication of the ground;[545] no other decorative elements are ever present. The chief differences lie in the rendering of the bull's head, which is usually in profile but also frontal, and the position of the leaper(s). The repetition provides compelling evidence that these representations go back to a common source, whether an archetypal signet ring or the scene in a different medium, such as wall painting.[546]

The surviving examples of sealings with bull-leaping scenes found throughout Crete indicate that at least 17 sizeable metal rings were in the service of administrative functions between LM IA, attested at Akrotiri, and LM IB, attested in various sites on Crete.[547] There is, however, no way of telling whether the examples found in LM IB levels derived

533 Davis 1986, 401; Doumas 2000a, 972–73.

534 Koehl 1986.

535 Evans 1930, 209–32.

536 Some that render the topic with an evident degree of faithfulness to their LM prototypes: *CMS* V Suppl. 1B no. 135 (Antheia, Messenia); VI no. 336 (Archanes).

537 Davis – Stocker 2016, 637–39, no. 1, fig. 9.

538 *CMS* II,6 nos. 41–44.

539 *CMS* II,6 nos. 161, 162.

540 *CMS* II,6 nos. 255–259.

541 Zakros: *CMS* II,7 nos. 34–39. Knossos: *CMS* II,8 nos. 221–225 (no. 221 was found in the Eastern Temple Repository and is the impression of a cushion; nos. 222, 223 are obviously Mycenaean).

542 *CMS* V Suppl. 1A nos. 171, 172.

543 Hallager 1996, 207–13; Krzyszkowska 2005a, 182–84; Pini 2006; Tsangaraki 2010a; Weingarten 1983b, *passim*; 1986b, 289–93. See discussion in Chapter 4, pp. 186–94.

544 *CMS* II,6 no. 43 (Agia Triada) = II,6 no. 161 (Gournia) = II,6 no. 259 (Sklavokambos) = II,7 no. 39 (Zakros). Also: *CMS* II,6 no. 44 (Agia Triada) = II,6 no. 162 (Gournia) = II,6 no. 255 (Sklavokambos). The illustration in Krzyszkowska 2005a, 190, demonstrates the matter more clearly.

545 The ground is absent on the impression from the Eastern Temple Repository (*CMS* II,8 no. 221).

546 Blakolmer 2010, 92–93, where the possibility of the theme having been copied from a wall painting is examined.

547 *CMS* V Suppl. 3 no. 392 (Akrotiri); II,6 nos. 41, 42 (Agia Triada); II,6 nos. 256, 257, 258 (Sklavokambos); II,7 nos. 34, 35, 36, 37, 38 (Zakros); II,8 nos. 221, 222, 223, 224, 225 (Knossos); *CMS* V Suppl. 1A nos. 171, 172 (Chania); II,6 nos. 43/161/259/II,7 no. 39 (multiple impressions on sealings found at Agia Triada,

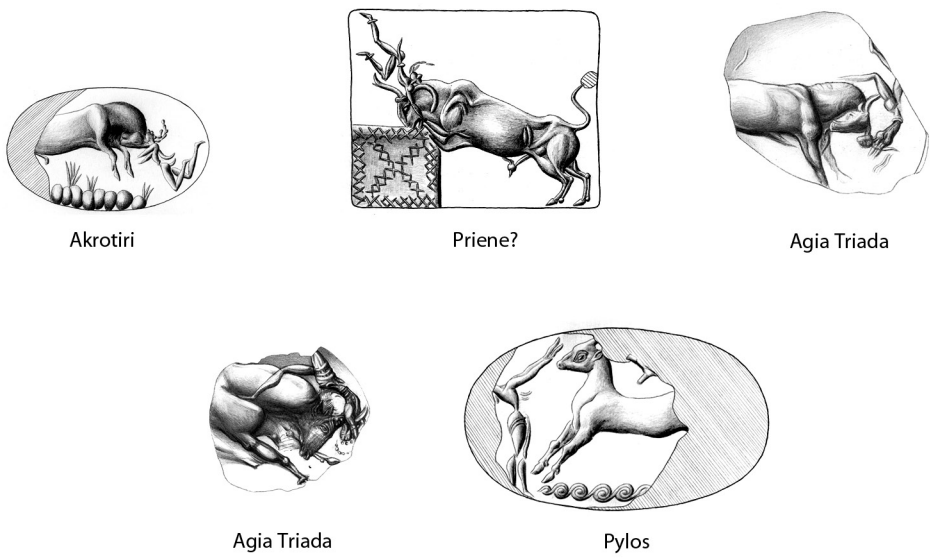


Fig. 67. Seal impressions and a seal with bull-leaping/grappling motif (from left: *CMS* V Suppl. 3 no. 395; VI no. 181; II,6 nos. 39, 40; I no. 305); scale 3:2 (*CMS* Archive).

from rings in simultaneous use, since the sealings were found in archival deposits and we lack any information regarding the time-scale involved. Moreover, one cannot, exclude the possibility that, much like the chariot scene ring that was manufactured in LM IA but also stamped sealings found in LM IB deposits, other sealings from such deposits may have also been stamped by seals which were manufactured in LM IA.[548] What could be of some significance is the fact that the large bull-leaping ring, which appears to dominate the Akrotiri batch, is not attested in any of the LM IB destruction deposits, and may no longer have been active at this time.

BULL-LEAPING/GRAPPLING SCENE: A LEAPER/CATCHER CONFRONTING A BULL

The second bull-leaping scene comes from a small-sized gold ring with original dimensions estimated as c. 1.7–1.8 × 1–1.1 cm (*Fig. 67, left*); the impression is attested nine times on sealings always together with another specific seal.[549] It depicts a different phase in bull-leaping from that shown on the previous ring: the moment when the leaper is face-to-face with the animal. An alternative interpretation is that the scene depicts the capture of an animal for later use in bull games.[550]

Sklavokambos, Zakros and Gournia); II,6 nos. 44/162/255 (multiple impressions on sealings found at Agia Triada, Sklavokambos and Gournia).

548 This last thought, Krzyszkowska, pers. comm.

549 Doumas 2000b, 61, motif E: 'bull-leaping'; *CMS* V Suppl. 3 no. 395. The other seal is *CMS* V Suppl. 3 no. 396.

550 Krzyszkowska 2014, 345. Given the exceptional setting of the scene, a rural environment (see further below), this interpretation sounds more plausible.

The seal face shows a bull in right profile, charging toward a bull-leaper or a bull-catcher; the animal's sex is clearly indicated. The man is rendered in left profile, has long braids and probable hair locks on the top of his head, and wears a loincloth; his knees are bent and he confronts the bull directly at close-quarters. It is not clear whether the animal has wounded the man with his horns, but the leaper's hands are visible and free.

At the bottom of the seal face there is an indication of the location where the action is taking place, namely a rocky landscape with vegetation; incidentally, this is a unique setting for such an activity.[551] This particular scene clearly illustrates that already in LM IA a standardized Minoan iconography was in existence, where individual motifs intermingled and were combined without particular reference to the event *per se*. A typical bull-leaping or bull-catching scene, which, when attested on seals and seal impressions, takes place in a structured environment that is usually a paved space, is here represented in a rocky landscape, a clear indication of the natural environment.

One of the most noteworthy examples of this scene occurs on a seal said to come from Priene in Turkey, datable on stylistic grounds to MM III–LM I (*Fig. 67*).[552] As at Akrotiri, the man confronts the bull and tries to catch it by the horns, though here the animal leans its forelegs and muzzle against a built structure. The motif is attested in a slight variation in two separate seal impressions from Agia Triada (*Fig. 67*),[553] where the man appears at the initial stage of leaping rather than confronting the bull. The Akrotiri seal impressions constitute the earliest attestation of this motif.

A number of seals[554] and sealings[555] dating to the Mycenaean period display the same motif, albeit executed in an increasingly stylized manner. Several centuries after the Neopalatial period it appears again on an administratively active seal at Pylos: in this case the man stands with arms outstretched as if attempting to stop the charging bull; a groundline is a running spiral frieze, common in wall painting (*Fig. 67, right*).[556] The topic was apparently worthy of a Minoan administrative seal and continued to be so in Mycenaean administration.

The motif occurs in later periods in various artistic media, including one of the Vapheio cups.[557] The confrontation of humans that are usually armed with wild and large-sized animals seems to have been a favourite theme in Minoan glyptic, one which apparently promoted human bravery and force against nature and its representatives.[558]

551 Krzyszkowska 2010, 177.

552 *CMS* VI no. 181.

553 *CMS* II,6 no. 39: single-hole hanging nodule; *CMS* II,6 no. 40: two-seal flat-based nodule.

554 *CMS* I nos. 95, 137 (Mycenae, chamber tombs); I Suppl. no. 35 (Lykosoura, Arcadia); II,3 no. 105 (Kalyvia Kainourgiou); VI no. 344 (probably from Mirabello); VII no. 100 (unknown provenance).

555 Both from Knossos: *CMS* II,8 nos. 228, 229, two-hole hanging nodules, the second with a Linear B inscription.

556 *CMS* I no. 305.

557 On the 'violent' cup, presumably of Mycenaean manufacture, where the scene of the 'charging bull' in a rocky landscape can be found (Davis 1977, 25, 43, 390, figs. 7, 12, 17). Davis suggests that the scene depicts a 'round-up of bulls for ritual purposes, perhaps for the bull-leaping', but in view of finds such as this impression, her statement that 'forceful representations' are not attested in Minoan art, is unjustified (Davis 1977, 36, 40). See also, Blakolmer 2007, 32, figs. 1–3.

558 Krzyszkowska 2014, *passim*.

THE *COUCHANT* BULL

A single bull that is probably depicted lying on its side is encountered in an impression of a hard stone seal, presumably an amygdaloid, the preserved part of which is only 1.1 × 0.7 cm (*Fig. 68*). The seal was only used on one of the Akrotiri sealings, together with another uniquely attested seal.[559]

The bull can be seen in right profile[560] and has open jaws; no other decorative motif is visible on the preserved part of the impression. The pose is fairly common for various animals and hybrids that appear on Minoan seals: goats, lions, griffins, boars. *Couchant* bulls often appear in pairs, seemingly resting quietly. The popularity of the pose can perhaps be explained on artistic grounds, since an animal's bent and crouched legs are suitable for circular or oval seal faces. When additional animals appear in a composition with a recumbent animal, the latter is sometimes being attacked and grabbed in the neck. The half-open muzzle of the bull in this instance could be indicative of pain and the recumbent pose may have been excerpted from a bull-hunting scene. The fact that recumbent animals are sometimes shown with their heads turned back, as if to see if they are being followed, or have been speared, further reinforces the impression that the motif of the *couchant* animal derives from representations of hunting scenes.[561] A parallel for the bull's rendering and expression can be found again on the Vapheio cups.[562]

A LIONESS ATTACKING A BOVINE

A further scene involving a bovine is preserved on a fragment of a unique single-hole hanging nodule (*Fig. 69, left*).[563] The impression comes from a hard stone seal; the preserved part of the scene measures 1.2 × 1.15 cm and the original dimensions of the seal are estimated as c. Ø 1.5–1.6 cm.

A female lion with three prominently shown teats[564] is attacking a bovine, apparently with success. The victim lies on its back with its hind-legs above the belly and its head contorted backwards, indicating intense agony and a struggle; the lioness rests its front paws on the bovine's chest. A rocky landscape is indicated in a summary fashion. Although only a small part of the scene is preserved, most of the bovine is visible, suggesting that the lioness had not yet bitten her prey but stood in a triumphant pose atop it.

Lions attacking animals such as bovines, agrimia etc., is a popular theme in Minoan glyptic,[565] and appears in various combinations. One or more lions are shown charging against a single victim; several phases of the attack are also depicted, from chasing the

559 Doumas 2000b, 61, motif H: 'couchant bull'; *CMS* V Suppl. 3 no. 398. Its pair is *CMS* V Suppl. 3 no. 399.

560 The bull would have been seen in left profile on the seal face.

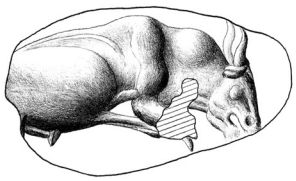
561 Krzyszkowska 2014, 345.

562 Davis 1977, on both the 'violent' and the 'quiet' cups, see above, n. 557.

563 Doumas 2000b, 63, motif L: 'lioness attacking animal'; *CMS* V Suppl. 3 no. 401.

564 Compare the pronounced indication of animal teats on a sealing from Knossos (*CMS* II,8 no. 342). Also: female lions share a number of iconographical features with female griffins, teats being a case in point (e. g. *CMS* I no. 271, Myrsinochori-Routsi; II,3 no. 219, Avdou); yet griffins generally do not appear in bellicose or violent circumstances such as this one.

565 Pini 1985, 153. The lion as prey is also present in Minoan and Mycenaean glyptic (Krzyszkowska 2014, 346).



VS3 398

Fig. 68. Seal impression with the motif of a *couchant* bull (*CMS* V Suppl. 3 no. 398) (*CMS* Archive).

Akrotiri Zakros Malia Knossos Myrtos-Pyrgos

Fig. 69. Seal impression with the motif of a lioness attacking a bull (*CMS* V Suppl. 3 no. 401; II,7 no. 102; II,1 no. 419; II,8 no. 362; II,6 no. 234); scale 3:2 (*CMS* Archive).

victim to catching and biting it. All these variations are found on seals,[566] but seals with these themes were also used for sealing (*Fig. 69*).[567] In most scenes the action is captured at the moment when the lion actually bites its prey; on the Akrotiri sealing the moment shown is immediately after the attack is over and the victim is clearly beaten. An exact parallel for this specific moment is found on a seal impression on a roundel from Myrtos-Pyrgos (*Fig. 69*).[568]

The scene finds parallels not only in seal iconography, but also on other media.[569] Most famously, lions hunting a bull against the backdrop of exotic palm-trees appear on a gold sheet from Shaft Grave III at Mycenae.[570] From the same site, a dagger shows a lion hunting

566 One lion, one victim: *CMS* I nos. 251 (Vapheio), 286 (Myrsinochori-Routsi); II,3 no. 44 (Knossos); V Suppl. 1B no. 140 (Antheia, Messenia). More than one lion surrounding the prey: *CMS* II,4 no. 202 (Dictaean Cave); VI no. 372; XII no. 251.

567 All instances fall under the theme *Tierüberfall*: *CMS* II,7 nos. 100–102 (Kato Zakros). Numerous examples are found at Knossos, where the combination of two bulls-one lion also appears (*CMS* II,8 nos. 334–363). An interesting instance is the impression of a hard stone lentoid on a clay stamp seal (*Tonstempel*; see *CMS* II,8 pp. 81–83) from the Malia *Dêpot hiéroglyphique* (*CMS* II,1 no. 419). A similar stamp clay seal is found at Knossos (listed immediately above: *CMS* II,8 no. 362).

568 *CMS* II,6 no. 234, although the drawing appears in *CMS* as 'uncertain'.

569 Marinatos (1928, 110) thought that he recognized the motif in a relief wall painting at Knossos, but the surviving evidence cannot corroborate his suggestion. Evans underwent numerous changes of heart on the matter, also on account of Marinatos' reconstruction (Evans 1935b, 537–38).

570 Karo 1930, 59–60, nos. 119, 120, pl. XXXIII.

five gazelles, one of which he has caught and bites in the neck.[571] The bitten gazelle with head turned back abnormally and in agony belongs to the same iconographic *topos* (pattern) as that on the Akrotiri impression. Recently it has been suggested that some fragments of wall paintings from Tell el-Dabʿa in Egypt portray a pride (?) of lions attacking a bull.[572]

While we are not short of relevant comparanda after LM I, until recently it has been difficult to determine whether lion attack scenes existed prior to the Akrotiri example.[573] Pini thought that such scenes were absent in MM II–III iconography; certainly hunting scenes existed during that period, but they seemed to involve dogs chasing prey, not lions.[574] Akrotiri has now provided evidence for one of the earliest depictions of lion aggression in the form of a clay lentoid flask from a level corresponding to MM IIIA in central Cretan terms; the vessel bears the inverse relief of a feline clawing a bovine in flying gallop, a scene set in a rocky landscape.[575]

A BUILDING AND TWO BOVINES

Finally, two bovines appear next to a built structure in a poorly understood scene (*Fig. 70*).[576] The unique impression probably derived from a large gold ring; the preserved part of the impression measures 2.4 × 1.6 cm.

The impression shows on the left part[577] a two-storey building with columns on the ground and upper floors, in all probability a cult building. On the upper floor there are two partially preserved motifs which could be 'floating' objects; one of the two recalls a stylized 'sacral knot'. The remainder of the seal surface was taken up by two bovines. One is shown in right profile running away from the building; above it, the second bovine lies on its back, contorted unnaturally, with its hind-leg twisted across its body and with its lowered head turned back in agony. Since we are not lacking a large portion of the original seal surface, we may safely assume that no other figures would have been present.

The poses of the bovines, where one bovine is running for its life and the other has already succumbed to an absent enemy, remind us of an animal attack scene. But on Minoan seals these usually include an indication of a natural setting, where the action would take place and no buildings are to be seen. Built-structures with columns, especially two-storeyed ones, are usually found in cult scenes, where human participants, both male and female, with raised arms sometimes bring offerings towards the building. In the few instances where animals are associated with buildings, they accompany humans and are clearly subdued by them,[578] or have assumed a heraldic role (*Fig. 70*).[579]

571 Karo 1930, 95–97, no. 394, pls. XCIII, XCIV.
572 Marinatos 2012.
573 Shapland 2010a, on the changes of lion iconography in Crete throughout the Bronze Age.
574 Pini 1985, 154, referring to *CMS* II,5 no. 284 (Phaistos); II,8 no. 353 (Knossos 'Hieroglyphic Deposit').
575 Knappett – Nikolakopoulou 2008, 19 no. 34, fig. 17, with a parallel from Anemospilia in central Crete, on which only a bull is depicted.
576 Doumas 2000b, 63, motif O: 'building and bulls'; *CMS* V Suppl. 3 no. 404.
577 Which would have been on the right-hand side of the scene on the original seal.
578 *CMS* I nos. 119 (Mycenae) and 292 (Pylos); II,8 no. 256 (Knossos).
579 *CMS* I no. 123 (Mycenae); II,8 no. 328 (Knossos).

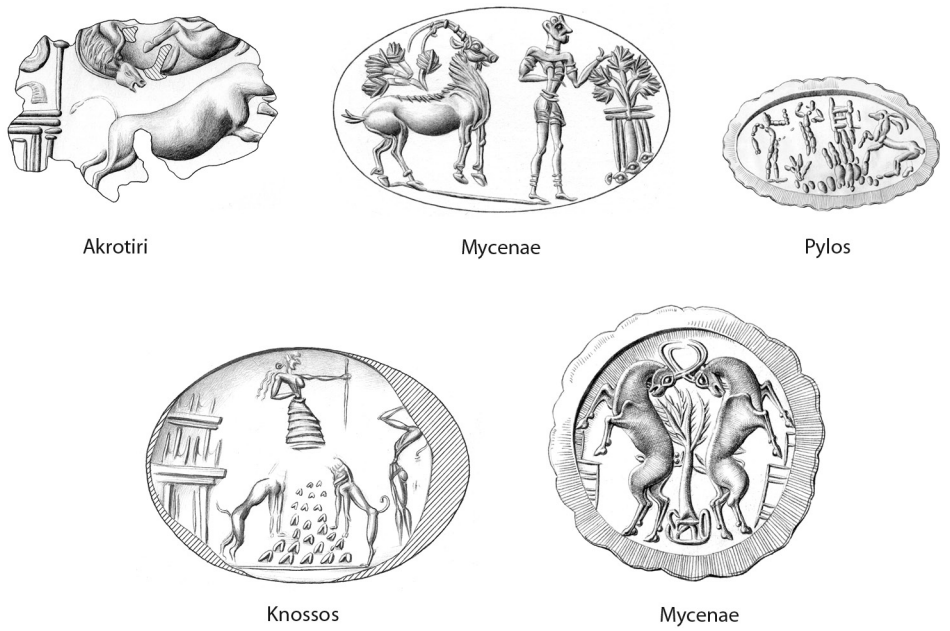


Fig. 70. Seal motifs with buildings and animals (*CMS* V Suppl. 3 no. 404; I nos. 119, 292; II,8 no. 256; I no. 123); scale 3:2 (*CMS* Archive).

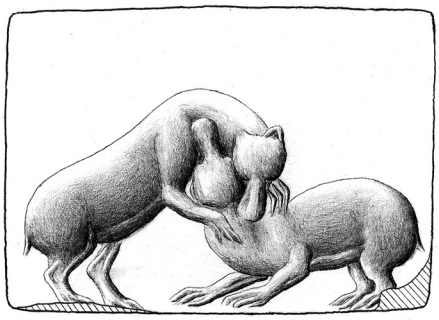
Other Animals in Pairs

Apart from the abundant bull/bovine iconography, other animals, namely dogs and birds, appear in various seal impressions. A pair of fighting dogs[580] and another of standing ones[581] were engraved on two cushions, which were used on numerous sealings found at Akrotiri; we have no means of establishing whether or not the presence of the two pairs of dogs as motifs was accidental.[582] Except for dogs, a possible pair of birds appears on a single impression.[583]

pair of fighting dogs

A hard stone cushion was the second most frequently used seal for stamping the Akrotiri nodules, since 31 nodules bear its impression.[584] In all verifiable cases, i. e. except when the nodule was too fragmentary, it accompanies the large ring with the bull-leaping scene.[585] The seal bore the motif of two fighting dogs and originally measured c. 2.15 × 1.4–1.5 cm (*Fig. 71*).

580 *CMS* V Suppl. 3 no. 393.
581 *CMS* V Suppl. 3 no. 396.
582 The question posed already in Dionisio *et al.* 2014, 124.
583 *CMS* V Suppl. 3 no. 405.
584 Doumas 2000b, 59–61, motif C: 'animal device'; *CMS* V Suppl. 3 no. 393.
585 *CMS* V Suppl. 3 no. 392.



VS3 393

Fig. 71. Seal impression with the motif of fighting dogs (*CMS* V Suppl. 3 no. 393) (*CMS* Archive).

The dogs are shown at the moment when they bite each other's necks. They occupy the centre and the lower part of the seal face, but the upper half remains unusually empty; there are no supplementary decorative motifs in the background, nor any indication of a setting for the action, whether it was a natural or urban environment. A single ear is shown on one dog only; the animals have very short, almost non-existent tails, which is rather unusual in Minoan iconography, where dogs usually have a short or bigger, curly tail.[586]

The dog appears quite frequently in Minoan iconography, either as the single motif on a seal face or accompanying a human or other animals including other dogs in later periods. Dogs are usually shown in profile, frequently with their head turned back; a dog's head in profile, mostly with its mouth half-open and a characteristically protruding tongue, is a frequent motif in the Protopalatial period.[587] A possible symbolic role of the dog as a guardian on seals has also been postulated.[588]

Several representations of dogs, showing either one or two animals, with minimal or no indication of the background, occur among the Agia Triada seal impressions.[589] Three impressions in particular show two dogs attacking each other, portrayed in a manner roughly comparable to the example from Akrotiri.[590] On all three the dogs are very close to each other, but are not yet touching; in two cases they assume a heraldic position facing each other and appear completely symmetrical, whereas in one instance they are on top of each other. The same poses as the Agia Triada dogs are usually adopted by lions,[591] but also bovines or goats,[592] or boars.[593] Lions on seals facing the perimeter of the seal face are strongly reminiscent of the Parading Lions Group seals that date to EM III–MM IA.[594]

586 Some soft stone MM seals only show such short tails: *CMS* III no. 197; VI no. 42 (Malia); IX no. 1.
587 *CMS* II,5 nos. 299, 300 (Phaistos); II,8 nos. 37, 38, 75 (Knossos).
588 Dimopoulou 2010.
589 *CMS* II,6 nos. 75–80.
590 *CMS* II,6 nos. 77–79; all three presumably came from metal signet rings; two are attested on a roundel and a flat-based nodule as the sole seal impression.
591 *CMS* I Suppl. nos. 93a, 94a; II,3 nos. 347, 348; III nos. 399–403; V no. 493; VII no. 90; VIII no. 79; IX nos. 134, 143; X nos. 155–157; XI no. 307.
592 *CMS* III no. 435; V no. 318; IX nos. 131–133; X nos. 294, 295; XI nos. 59, 186; XIII no. 132.
593 *CMS* V Suppl. 3 no. 220.
594 Yule 1981, 208–09; Sbonias 1995, 89–99.

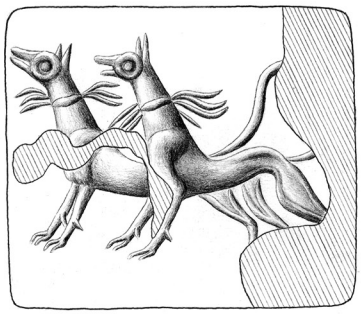


Fig. 72. Seal impression with the motif of a pair of dogs (*CMS* V Suppl. 3 no. 396) (*CMS* Archive).

Nowhere else are dogs shown biting each others' neck, but the theme does occur with other animals and hybrids: lion and bovine;[595] lion and deer;[596] dog and deer;[597] griffin and bovine/goat;[598] griffin and boar.[599] The use of cavalier perspective to depict an animal's head is usually reserved for the lion attacking a helpless victim. On the Akrotiri sealings both dogs are attacking and biting, and their heads both appear in cavalier perspective.

An interesting parallel for the interlinked dog's heads at Akrotiri occurs among the Phaistos seal impressions: in the centre of the composition two lions are inverted and face in opposite directions while their hindquarters are interwined.[600] Apart from this seal no close parallels exist.

PAIR OF STANDING DOGS

Another pair of dogs appears on a hard stone cushion with original dimensions estimated as c. 1.5 × 1 cm (*Fig. 72*).[601] The cushion was used to impress thirteen flat-based nodules, always collaborating with the small metal ring with the bull-grappling scene, except in one instance, when it collaborated with a circular hard stone seal with a 'tectonic' motif.[602]

The impression presents two dogs, one standing behind the other, looking to the left.[603] Both dogs wear collars, from which some sort of curled bands (ribbons [?]) wave in the air, extending either side of the necks. Both dogs are prick-eared, have a narrow muzzle, a slender build and sickle-shaped tails. The tail of the rear animal is fairly prominent and might instead be a kind of leash. There are no supplementary ornaments or any indication of the setting of the scene. Minoan seals frequently picture pairs of animals posing in the same

595 An attack scene attested many times, among which: *CMS* II,4 no. 80; V Suppl. 1B nos. 93, 94; VII no. 115a, no. 260 (a bovine or a goat); VIII nos. 121 (a bovine or a goat), 154 (unidentified animal); IX no. 142; X nos. 127–129, 131, 219, 241, 253, 271; XI no. 170.

596 *CMS* VI no. 374.

597 *CMS* VI no. 399.

598 *CMS* X nos. 125, 126; XII no. 228.

599 *CMS* II,3 no. 25b.

600 *CMS* II,5 no. 283.

601 Doumas 2000b, 61, motif F: 'pair of dogs'; *CMS* V Suppl. 3 no. 396.

602 Always with *CMS* V Suppl. 3 no. 395; except once with V Suppl. 3 no. 397.

603 The dogs on the seal face would have been looking to the right.

direction one behind the other; these include horses in chariot scenes and birds.[604] For the sake of symmetry their heads are sometimes turned in different directions, with one usually looking back, thus filling the empty space above the animals' backs.

Collars are quite common in representations of dogs on Minoan seals, but are also worn by griffins,[605] lions,[606] and even goats[607] and a Minoan Genius.[608] In all likelikhood the addition of a collar implies a tamed, domesticated animal; in this respect, it is noteworthy that griffins and lions may also be depicted with one. A peculiar feature on the motif from Akrotiri are the curled bands or ribbons; in other instances a single extension from the collar probably signifies a leash.[609] An impression from Zakros provides the only example of a collar similar to those at Akrotiri.[610] Whether the adornment of these dogs indicates a special occasion is unclear, since there is no indication of any background setting. It is possible, however, that collars signify hunting dogs: a similar dog with a collar is shown barking at a potential prey on a chalcedony cushion from Archanes.[611]

The dogs on the Akrotiri impressions are reminiscent of representations of Egyptian Middle Kingdom *tesem*-dogs (*tsm*: hunting dogs). The name was applied initially to a specific canine breed, a medium-sized greyhound with upright ears and curled-up tail that appears almost exclusively in Predynastic and Old Kindgom iconography. From the First Intermediate Period onwards more breeds began to be represented in Egyptian iconography, as evidenced by the so-called *Hundestele*, where five dogs of different types appear.[612] In the Middle Kingdom, a period more relevant to our Neopalatial example, *tsm*, which became the generic term in Egyptian vocabulary for 'dog',[613] could have upright, half upright or lop ears and curled-up or sickle-shaped tails.[614] The slender build of the Akrotiri dogs in combination with their upright ears and the sickle-shaped tails strongly recalls Middle Kingdom greyhounds.

FLYING BIRD(S)

The animal world is represented in the Akrotiri sealings by yet another species, birds. Parts of two birds are attested on a fragmentary impression, which measures 1.2 × 1.15 cm (*Fig. 73*).[615] The impression may have originated in a round-faced seal, possibly a lentoid. Despite the fact that the material of the original seal cannot be determined with certainty, the

604 For chariot scenes where two horses draw a chariot, see above pp. 117–20. For birds: *CMS* I no. 273 (Myrsinochori); II,3 nos. 142, 179, 307, 351–353; II,8 no. 172 (Knossos); IV no. 265 (Sklavi); V Suppl. 1B no. 57 (Asine); VI no. 461 (Kalo Chorio).

605 *CMS* I nos. 171, 196, 223, 473; II,8 nos. 193, 194; V no. 584; V Suppl. 3 no. 245a; X no. 170; XII no. 301.

606 *CMS* V Suppl. 1B no. 77; IX no. D13; X no. 135.

607 *CMS* II,3 no. 40; V Suppl. 1B no. 65.

608 *CMS* V no. 440.

609 *CMS* II,6 no. 76; II,8 no. 248; VII nos. 66, 115; XI no. 316.

610 *CMS* II,7 no. 65.

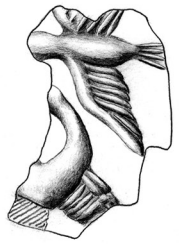
611 *CMS* VI no. 180, dated on stylistic grounds to MM III–LM I.

612 The *Hundestele* is an honorary stone *stele* set up for Intef II, pharaoh of the 11th Dynasty, in Thebes, on the occasion of the 50th anniversary of his reign; the ruler is depicted with five dogs, all of which have names (Arnold 1976, 52–56).

613 Goldwasser 2002, 91–110.

614 *EncAE*, 302, *s.v.* 'fauna, domesticated'.

615 Doumas 2000b, 63, motif P: 'flying bird'; *CMS* V Suppl. 3 no. 405.



VS3 405

Fig. 73. Seal impression with the motif of flying birds (*CMS* V Suppl. 3 no. 405) (*CMS* Archive).

composition makes hard stone or metal seem likely. The seal had been used on a two-seal flat-based nodule, which is, however, missing its second impression.

The scene includes parts of two birds flying with outstretched wings; one has a contorted neck, either turning to the back or its side. No supplementary decorative motifs are present in the background. The possibility that the second fragmentary 'bird' with the contorted neck might have been a winged creature instead, such as a griffin pursuing the first bird, cannot be excluded.[616] The presence of additional creatures is also conceivable.[617]

Two birds appear fairly frequently on Minoan seals, but they are mostly depicted in profile. They also accompany other members of the animal kingdom, including spiders, fish and dolphins, as well as mythical creatures, such as the griffin. They are rarely pictured with humans and, when they are, the occasion seems exceptional, to judge from the clothing of the latter.[618] A lentoid from Mycenae shows two birds flying in roughly the same direction, although facing opposite directions;[619] a more distant parallel where two flying birds are shown in different poses occurs on a 'talismanic' lentoid.[620] Stylistically similar is the motif that apparently depicts two flying birds attested on a roundel from the *Dépôt hiéroglyphique* in the Malia palace, which dates to a mature phase of the MM III period.[621]

Lion and Griffin/Sphinx Iconography

Other than bulls/bovines, a female lion, dogs and birds, a second lion in conjunction with a mythical creature makes its appearance among the Akrotiri sealings.[622] The creature, a

616 The actual attack scene includes a lion and a bird: *CMS* I Suppl. no. 75; II,7 no. 240 (Zakros). Griffins are attested together with birds on the same seal faces: *CMS* V Suppl. 1B no. 101 (Nauplion Museum); VI no. 269.

617 In the commentary to *CMS* V Suppl. 3 no. 405 it was suggested that there were originally at least three birds; see also *CMS* V Suppl. 1B no. 139 (Antheia, Messenia).

618 *CMS* I no. 233b (Vapheio); II,3 no. 170 (Knossos); II,4 no. 125 (Knossos); VI no. 318 (Knossos); VII no. 134; IX no. 154. In some of these the human is depicted as a 'Master of Animals'.

619 *CMS* I no. 151.

620 *CMS* X no. 248.

621 *CMS* II,6 no. 169 (Malia); for the dating of this deposit, see Chapter 4, n. 854.

622 *CMS* V Suppl. 3 no. 402.

VS3 402

Fig. 74. Seal impression with the motif of a lion and griffin (*CMS* V Suppl. 3 no. 402) (*CMS* Archive).

griffin or sphinx, is found again on yet a different impression.[623] The preserved hindquarters of a third animal on a third sealing point to a lion, a griffin or even a dog.[624]

LION AND GRIFFIN

The unique direct sealing from Room D18a bears the impression of a round seal face with the motif of a lion and a griffin;[625] the impression probably derived from a hard stone lentoid, which originally measured c. Ø 1.6–1.7 cm (*Fig. 74*).

A female lion and a female griffin, both with comparable indications of teats, are placed *tête-bêche* (head-to-tail). The two of them are running and the griffin's wings occupy the centre of the composition. In Minoan seals this composition usually involved animals of the same species, including fish or birds, in order to maintain symmetry;[626] lions also seem to have been a popular choice. Here, however, besides the fact that the lion is slightly larger in size than the griffin, we are dealing with two different species; symmetry is somehow only maintained by the fact that the griffin has the body of a lion. A comparably awkward rendering of the same two creatures was attempted on certain seals,[627] where they are shown head-to-head and tail-to-tail. Further examples of lions and griffins are also seen in different poses on seals and sealings,[628] but also other artistic media.[629]

The way the creatures are rendered — with small drill borings for the tips of their tails, their eyes, the end of the lion's muzzle, the tips of their teats, the curls on the griffin's wings; with vertical strokes for the lion's mane; with pronounced body contours — recalls the description applied to seals attributed to the so-called Jasper Lion Master, thought to have

623 *CMS* V Suppl. 3 no. 403.

624 Fragmentary seal impression on **N75**.

625 Doumas 2000b, 63, motif M: 'lion and griffin'; *CMS* V Suppl. 3 no. 402.

626 An exception appears on a seal with a griffin with open wings and a bovine depicted *tête-bêche*: *CMS* XII no. 228.

627 *CMS* II,3 no. 25a (Knossos); II,7 no. 97 (Zakros).

628 *CMS* I no. 510; III no. 503a; VI nos. 392, 393; VII nos. 116 (with a bull in their midst), 198; IX no. 148; XI no. 244 (two lions).

629 On the head of a golden pin: on one side, a pair of griffins rotate around the pin's head hole (their heads turned to the periphery), and on the other a pair of lions is carved (their heads towards the hole): Karo 1930, 78 no. 274, pl. XXXII.

VS3 403

Fig. 75. Seal impression with the motif of heraldic griffins/sphinxes (*CMS* V Suppl. 3 no. 403) (*CMS* Archive).

been produced at Knossos in LM I.[630] However, the composition lacks the symmetry and meticulous craftsmanship of the hard stone seals that bring seals together in the aforementioned group. An unusual feature is the way the griffin's wings are rendered, with four vertical strokes[631] and three horizontal which are connected to them with small drill borings. The earliest parallels for these simple wings are to be found among the Phaistos sealings, but the closest parallel is a seal impression from Agia Triada, which shows, however, more technical dexterity and precision than the Akrotiri specimen.[632]

Although no close parallels can be found for this motif, its overall characteristics, like the drill borings and strokes, allow us to place it within LM I seal production; its crude aspect, which admittedly stands out from the rest of the seals that were used for the Akrotiri sealings should not be seen as a criterion for earlier dating.

HERALDIC GRIFFINS/SPHINXES

Two griffins/sphinxes appear in another unique impression, which derived from a hard stone lentoid and is suggested in the *CMS* to have originally measured c. Ø 1.3 cm *(Fig. 75)*.[633] The seal was probably used on a flat-based nodule, but the nodule is fragmentarily preserved and it is not clear whether it bore just this one impression or more.

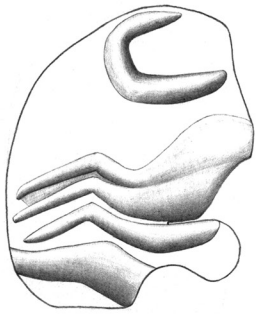
The two heraldic mythical creatures in profile are either griffins or sphinxes. The creatures are standing or sitting on the back legs and are placed antithetically front-to-front, in a composition that occurs frequently in Minoan glyptic. Another element — altar, column, tree, building, or even a probable divine figure in epiphany pose — is often placed between frontally-juxtaposed creatures; but they are also commonly depicted without anything in between them, in an apparently minimalist approach. When an element intervenes, the creatures seem to accompany it in a venerating or protective pose.

630 Younger – Betts 1979; Younger 1983, 119–20.

631 *CMS* II,5 nos. 317–318 (Phaistos): griffin wings with four and three simple almost straight strokes respectively; II,6 no. 265 (Sklavokambos): with three strokes; XI no. 6: with three strokes; V Suppl. 2 no. 67 (Elateia): with five strokes.

632 *CMS* II,6 no. 99: with nine strokes and drill borings.

633 Doumas 2000b, 63, motif N: 'heraldic griffins'; *CMS* V Suppl. 3 no. 403.



N75

Fig. 76. Seal impression on *nodulus* **N75**, running lion/griffin/dog (*CMS* Archive).

The particular composition is used with all kinds of creatures, such as animals, fish, birds, humans and mythical creatures. It can be seen as early as MM IIB in the Phaistos sealings, on which animals and mythical creatures are already portrayed.[634] The composition is encountered until the end of Mycenaean glyptic, when mythical creatures in lavish guise and intricate decoration prevail. Its most famous representation is the monumental sculpture of two lions facing a column in the Lion Gate at Mycenae.

A RUNNING LION/GRIFFIN/DOG

Nodulus **N75** bears part of an impression which is unique among the remaining Akrotiri nodules or in the corpus of Aegean seals and seal impressions in general. The fine craftsmanship of the motif, the oval shape and the size of the impression suggest it originated from a small-sized metal ring. The preserved part of the seal impression measures 0.58 × 0.73 cm and the original stamping surface would have been 1–1.1 × 1.7–1.8 cm (*Fig. 76*). It is probably safe to assume that more than half of the original stamping surface is now lost: it is either gone altogether, or it did not fit on the *nodulus* in the first place.

The preserved fragment shows the rear part of an animal in flying gallop running from left to right;[635] the rear legs and a curly tail are clearly visible. The curly tail is a standard convention for lions, but also appears on griffins, since they too have a lion's body. In addition, dogs were sometimes shown with curly tails. Below the running animal there appears to be an indication of the terrain, indicated by an undulating zone;[636] alternatively, it could be a small animal chasing after its prey, but the large size of this feature makes the former explanation more plausible.

The flying gallop is a pose usually reserved for animals that participate either as pursuer or prey in attack and hunting scenes. A number of lions and griffins run across the seal face while actually being pursued or simply as isolated motifs. The latter may have been

634 *CMS* II,5 nos. 282 (lions [?]), 323 (bird-men).

635 The animal would have been running from right to left on the seal surface.

636 Compare: *CMS* I nos. 10 (Mycenae), 15 (Mycenae), 252 (Vapheio); II,6 nos. 15, 57, 70, 72, 94 (Agia Triada), 282; II,7 nos. 42, 71, 101 (Zakros); II,8 no. 298 (Knossos); V no. 498 (Agia Irini, Kea); V Suppl. 1A no. 154 (Chania); V Suppl. 1B nos. 57 (Asine), 76 (Mycenae), 139 (Antheia, Messenia); VI nos. 178, 180 (Archanes); X no. 261.

Fig. 77. Seal impression with the motif of a procession (*CMS* V Suppl. 3 no. 394) (*CMS* Archive).

extracted from larger attack or hunting scenes, since the frenetic running rhythm does imply pursuit. In addition, landscape elements on LM I seals frequently relate to hunting scenes, as well as to possible combat scenes.[637] Apart from the attack and hunting scenes a pair of griffins in flying gallop is shown pulling a chariot on a sealing from the Knossos Eastern Temple Repository.[638]

More Human Iconography

Other than the human figure, notably the male figure, appearing in a chariot scene, also in bull-leaping and bull-grappling scenes, more males appear among the Akrotiri seal impressions. A man participates in a cultic procession,[639] a male torso is partly preserved on an impression,[640] and a third man takes part in what was likely a hunting scene.[641]

part of a procession

Among the impressions at Akrotiri there is one that clearly relates to the realm of cult. A so-called procession scene is impressed on two nodules, presumably coming from the oval bezel of a metal ring with original dimensions estimated as c. 1.8 × 1.1 cm (*Fig. 77*).[642] In both instances the other seal impression attested on the nodule derives from the large signet ring with the bull-leaping scene.

A man stands in three-quarters left pose and wears or carries either a robe or a 'sacral knot'.[643] He also wears ankle boots, seems to have short hair, and holds a double axe.

637 Krzyszkowska 2010, 177.
638 *CMS* II,8 no. 193. See here *Fig. 64, left*, and previously pp. 117, 120.
639 *CMS* V Suppl. 3 no. 394.
640 *CMS* V Suppl. 3 no. 399.
641 *CMS* V Suppl. 3 no. 400.
642 Doumas 2000b, 61, motif D, 'procession'; *CMS* V Suppl. 3 no. 394. See also Chapter 4, pp. 210–13, and Concluding Remarks, pp. 218–19.
643 It was first recognized and named as such by Evans (Evans 1921a, 430–35). Also named a 'ritual dress' or a 'sacred garment' at times; recently named as 'cloak knot' (Crowley 2013, 355–56).

Behind the man there is a wide, horizontal band decorated with running spirals, a possible imitation of the frieze of wall painting.[644]

The 'sacral knot' is usually found on seal faces as a supplementary motif floating in the background.[645] In some few instances it is worn by men who participate in processions, apparently of ritual character.[646] In one procession a man carries a double axe, while a tassled object, which is probably a 'sacral knot', floats in front of another participant.[647] The scene implies that one of the participants in the procession was actually carrying the knot. Comparable scenes depict: a woman who carries a double axe on her shoulder with the 'sacral knot' placed in front of her;[648] two men carrying the 'sacral knot';[649] several men hugging a person carrying the 'sacral knot';[650] a procession of two figures, one holding (or preceded by) a 'sacral knot', the other carrying a double axe.[651]

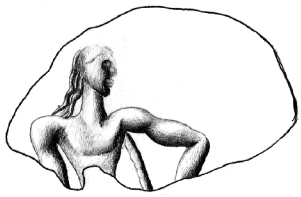
It has been suggested that the combination of a double axe with a 'sacral knot' first appears at the transition from MM III to LM I, the date to which the 'Hieroglyphic Deposit' in the palace of Knossos is now assigned.[652] The exact circumstances in which these processions took place escape us. The carrying of a double axe and a 'sacred knot', however, can be seen in the wider frame of processions that involve transporting cult equipment, as opposed to procession scenes where goods necessary for festivities, such as foodstuffs and sacrificial animals, are carried.[653]

MAN

The upper half of a male torso appears on a partially stamped impression.[654] The impression is found on a two-seal flat-based nodule and it most likely derived from a metal signet ring, the original dimensions of which cannot be estimated from the small size of the preserved fragment: 1 × 0.7 cm (*Fig. 78*). The impression was accompanied by another impression made from a hard stone seal, in all probability an amygdaloid, with the motif of a *couchant* bull.[655]

The male torso is depicted frontally, with the man's right hand directed downwards, and his left hand bent either clutching his waist or holding a rod (a staff [?]) reaching as far as his arm pit. The man's head is depicted in right profile and he has long braids.[656] He does not appear to be clothed from the waist up, but a loincloth probably covered his pelvis.

644 Blakolmer 2010, 93–94. For further analysis and a 3D model of how this male figure would stand in front of the frieze of a wall painting, see Günkel-Maschek 2012, 117, fig. 1.
645 Among others: *CMS* II,6 no. 4 (Agia Triada); II,7 no. 7 (Zakros); V Suppl. 1B no. 142 (Antheia, Messenia); VI no. 336 (Archanes).
646 *CMS* II,6 nos. 7, 11 (Agia Triada).
647 *CMS* II,7 no. 7 (Zakros).
648 *CMS* II,3 no. 8.
649 *CMS* II,3 no. 145 (Malia, dated to MM III–LM I).
650 *CMS* II,6 no. 7 (Agia Triada).
651 *CMS* II,7 no. 7 (Zakros).
652 Krzyszkowska 2005a, 115–16.
653 Blakolmer 2008, 259.
654 Doumas 2000b, 61, motif I: 'man'; *CMS* V Suppl. 3 no. 399.
655 *CMS* V Suppl. 3 no. 398.
656 On the original seal face the man would have been looking left.



VS3 399

Fig. 78. Seal impression with the motif of a man (*CMS* V Suppl. 3 no. 399) (*CMS* Archive).

One cannot be sure that the man is standing, since men in similar positions are also seen walking.[657]

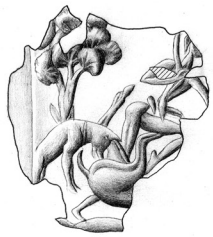
The rod could belong to a spear, which men are quite often seen carrying on Minoan seals; but placing a spear under one's armpit is certainly not practical. There are a few seals where men are depicted carrying staffs of unknown function under their armpits. In a unique representation a man bends slightly while holding a staff.[658] Two more men appear in two nodules from Zakros probably holding a similar staff;[659] one also appears to have long braids and is involved with other participants in a scene of unclear nature.[660] A man in front of a bull is also attested leaning against a staff.[661] Finally, on another sealing a naked woman with long hair and curls on the top of her head appears to be leaning against a staff.[662]

Whether the staff defines the actions in which the individuals engage is hard to say. Their common characteristic, when visible, is that they have long hair and even curls atop their heads, an observation also valid for the woman uniquely shown with a staff. As previously discussed in connection with the bull-leaper in the large bull-leaping scene, long hair, at times braided, characterizes young boys/women who have presumably entered puberty and undergo rites of passage.[663] Whether the figures on seals and sealings, including the Akrotiri example, shown with long hair and staffs are also undergoing a rite of passage[664] is a matter of conjecture.

SCENE AT A TREE

A part of a hunting scene, of preserved dimensions 1.3 × 1.35 cm, is depicted on an impression that most probably came from a sizeable metal ring (*Fig. 79*);[665] if so, then we could be

657 *CMS* V Suppl. 3 no. 288 (Portes, Achaea).
658 *CMS* V Suppl. 1A no. 338, a seal of dubious authenticity however.
659 *CMS* II,7 nos. 3, 4.
660 This scene is much discussed because of its uniqueness: Levi 1925–26b, 159; Marinatos 2007; more recently, Koehl 2016, 123–28.
661 *CMS* II,8 no. 233 (Knossos).
662 *CMS* V Suppl. 1A no. 143 (Chania).
663 Davis 1986, 401; Doumas 2000a, 972–73.
664 Koehl 1986; 2016.
665 Doumas 2000b, 61, motif K: 'scene at a tree'; *CMS* V Suppl. 3 no. 400.



VS3 400

Fig. 79. Seal impression with the motif of a scene at a tree (*CMS* V Suppl. 3 no. 400) (*CMS* Archive).

missing up to two-thirds of the scene, which probably extended on both sides of the preserved part. The ring was used once on a flat-based nodule, on which it is the sole impression attested.

In what appears to be a natural setting, defined by a tree at the back and an uneven groundline, a dog is biting the rear part of a fallen victim, a buck or goat, while a man looks away to the right, probably pursuing another animal that is not visible here. It is possible that another man was also present and that both were attacking the missing animal.[666] The dog wears a collar and the man, wearing nothing but a belt, is holding something, conceivably a shaft or bow, over his shoulder. To the left of the impression[667] there is a flat recession of the seal face; the feature is not easily explicable, but may have served to divide the seal surface into segments for yet another scene.

Hunting scenes most often involve a hunted animal and one or more dogs in pursuit or having already caught their prey. Men also appear, sometimes in full gear carrying spears and figure-of-eight shields. The lion hunt is a popular Minoan topic but other scenes include the hunting of boars or bucks. The human presence is implied even in scenes when an animal appears alone with a spear on its back. Animals lying on their backs appear only in hunting or sacrificial scenes.

Naturalistic trees are not encountered very often on Minoan seals. Most tree depictions are reduced to tree branches and do not serve as integral elements in the scene. However, entire trees are sometimes depicted on sizeable gold Neopalatial rings with multi-figured scenes,[668] some of which were also used for stamping administrative documents.[669] Some of these scenes qualify as 'ritual' and, at times, the tree is situated in the middle of the action, echoing Evans's theory of 'tree cult'.[670]

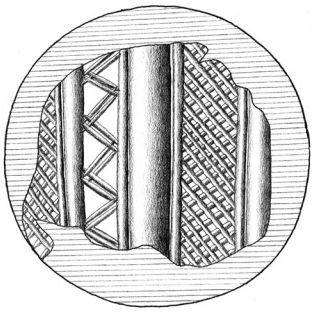
666 Compare *CMS* XI no. 165.

667 Which would have been to the right on the original seal face.

668 Krzyszkowska 2010, 178–80.

669 *CMS* I nos. 17 and 119 (both Mycenae), 219 (Vapheio); II,6 no. 5 (Agia Triada); V Suppl. 1B no. 114 (Aidonia); VI nos. 279 (Mycenae), 280 (Knossos); IX no. 29.

670 Evans 1901.



VS3 397

Fig. 80. Seal impression with a 'tectonic' motif (*CMS* V Suppl. 3 no. 397) (*CMS* Archive).

A Unique Geometric Pattern: 'Tectonic' Motif

A well-known motif, the 'tectonic' motif, is attested once on a two-seal flat-based nodule.[671] The impression came from a hard stone seal with a round, convex face suggested to have originally measured c. Ø 1.3–1.4 cm (*Fig. 80*).

The time frame within which this motif is attested on Minoan seals is usually defined as MM II–III.[672] The term 'tectonic' motif — as opposed to the older name 'architectural'[673] — refers to a mixture of linear patterns that supposedly imitate building parts,[674] although this is often hard to discern.[675] Certain hard stone samples are masterpieces of detail and the intermingling of vertical, horizontal and diagonal lines shows how well seal engravers had mastered the then new techniques of hard stone engraving.

Some 126 seals are listed in the online *CMS Seal Database* as belonging to this style group; examples in hard stone constitute the majority with 70 pieces. Hard stone seals were also used on seven sealings,[676] one of which is under discussion here. 'Tectonic' motifs appear in 54 soft stone seals; an additional four soft stone seals had a sphragistic use.[677] A

671 Doumas 2000b, 61, motif G: 'architectural design'; *CMS* V Suppl. 3 no. 397.

672 Krzyszkowska 2005a, 86–87; Pini 2007.

673 Krzyszkowska 2005a, 86–87.

674 Evans 1921a, 564–65.

675 *Pace* Yule 1981, 145–46. At p. 173 the author discusses the process of 'pictorialization' ('the process in which the originally abstract motif is transformed into a representation of an object to which it bears some similarity', see Furumark 1939, 34–51), and uses the 'tectonic' motif as the most characteristic example. In agreement with the interpretation that sees building parts as the model, Schiering 1984.

676 *CMS* II,8 no. 94: on a one-seal flat-based nodule from the Eastern Temple Repository (round surface); *CMS* II,8 no. 95: on a two-hole hanging nodule with Linear A inscription from the North-East House in Knossos (cushion seal impressed twice); *CMS* II,8 no. 99: on a one-seal flat-based nodule from Knossos (impressed by a cushion, more specific findspot unknown). The 'tectonic' seal impressions from Phaistos appear to me to have been impressed by hard stone seals (*CMS* II,5 nos. 242–244, all with round seal faces).

677 All were found in Knossos. *CMS* II,8 nos. 93: a cushion impressed a one-seal flat-based nodule (Eastern Temple Repository); 96: a round-faced seal stamped a pithos (Magazine of the Medallion Pithoi); 97: a round-faced seal impressed a one-seal flat-based nodule ('Hieroglyphic Deposit'); 98: a cushion impressed a one-seal flat-based nodule ('Hieroglyphic Deposit').

metal discoid,[678] and a discoid probably made of breccia, which is a medium-hard stone, are also encountered.[679] The discoid is the leading shape on which this motif occurs, followed by cushions and amygdaloids.[680] The findspots and dating of most examples suggest that the motif first appeared and probably peaked in MM II, but it continued into MM III.

The distribution map of 'tectonic' seals with secure provenance and dating includes sites such as Chania in western Crete, Agia Irini Kainourgiou, Kamilari and Koumasa in the Mesara, Gournes Pediados, Malia and Viannos in central-eastern Crete. 'Tectonic' seals were also among the seals that circulated beyond Crete, in sites such as Agia Irini in Kea and Miletus. A number of these survived for many years after their production as heirlooms, such as one from the LM III cemetery of Armenoi near Rethymnon.[681]

Sealings with impressions of 'tectonic' seals are already attested in the *Archivio di Cretule* at Phaistos,[682] they occur among the impressions from the 'Hieroglyphic Deposit' at Knossos,[683] and are also found in the Knossos Eastern Temple Repository.[684] The latest example from Crete seems to be a single-hole hanging nodule with a Linear A inscription, which was found in the North-East House at Knossos.[685] According to the dates assigned to the respective contexts, it appears that these seals had an administrative use in Crete from the MM II period continuing into MM III. The Akrotiri seal impression appears to be the latest verified use of such seals for administrative purposes (LM IA), with the seal approaching the status of an heirloom.

If the distribution maps of seals and sealings with the 'tectonic' motif are combined, they appear to coincide only in the Mesara. It is, however, remarkable that in the Neopalatial period only Knossos has examples of both hard and soft stone seals with 'tectonic' motifs in administrative use. With regard to the Akrotiri sealing, it is also noteworthy that none of the previously attested 'tectonic' impressions on sealings ever 'collaborated' with another seal in stamping a document. The Akrotiri sealing shows that one such seal 'worked' together with a hard stone cushion depicting two standing dogs in order to produce a sealing;[686] it is interesting that the cushion also changed 'partner' and is found together with a metal (gold [?]) ring bearing a bull-grappling scene.[687]

678 *CMS* II,1 no. 404.

679 *CMS* II,2 no. 323.

680 Yule 1981, 50–54: Discoids; Pini 2007, 228.

681 Also: *CMS* II,1 nos. 5 (Agia Irini Kainourgiou), 146 (Koumasa), 404 (Gournes Pediados); II,2 nos. 9, 11, 18 (Kamilari), 81 (Malia), 200 (Viannos); V nos. 488, 492 (Agia Irini, Kea); V Suppl. 1A no. 57 (Malia); V Suppl. 1B no. 237 (Armenoi); V Suppl. 3 nos. 106 (Chania-Splantzia), 498 (Miletus).

682 *CMS* II,5 nos. 242–244.

683 *CMS* II,8 nos. 97, 98.

684 *CMS* II,8 nos. 93, 94.

685 *CMS* II,8 no. 95 (*GORILA* II no. KN Wb 33). The findspot is confirmed through Gill's localization of the Knossos sealings, where this sealing is described as 'seal impression suggestive of the period of the Zakros sealings' and the date given is MM III–LM I (*CMS* II,8 pp. 107, 127). The same date is given by Evans (1922, 321).

686 *CMS* V Suppl. 3 no. 396.

687 *CMS* V Suppl. 3 no. 395. See further Chapter 4, pp. 203–08.

DISCUSSION: MINOAN SEALINGS AT AKROTIRI

The Akrotiri sealings offer a unique opportunity for a full archaeological, typological and iconographical investigation. Firstly, they constitute the only Neopalatial sealings for which we possess detailed depositional data; for this reason, it was opportune to contextualize and assess their situation within the settlement of Akrotiri. This is not to say that what is valid for Akrotiri also applies to Crete; one of the goals of this investigation has been to pinpoint the similarities and differences with the corresponding evidence from Crete, so as to comprehend and evaluate the situation. As in every archaeological assemblage, however, gaps in evidence exist and there is always a degree of subjectivity in the way we view and interpret relevant evidence.

Secondly, the excellent state of preservation of the sealings themselves, assisted by the fact that they did not undergo any firing process, allow a number of valuable typological observations, which go beyond the information gained so far by evidence retrieved in Crete. Some of this information is discussed in Chapter 4, since it helps provide a more general understanding of Neopalatial sealings and administrative procedures.

Thirdly, the iconographic evidence offered by the Akrotiri sealings, together with comparanda from Crete, available through the printed volumes of the *CMS* and its electronic version, the *CMS Seal Database* available through *Arachne*, enhances our understanding of the repertoire and encourages extremely detailed study. The comparisons and hypotheses presented here have benefitted greatly from the systematic documentation of Aegean glyptic by the *CMS*; certain observations regarding iconography are only possible now, more than 100 years after the first Minoan sealings were found in Crete, only because of the existence of the *CMS*.

The following discussion results from the combined insights gained because of the factors mentioned above. In the present chapter the focus has been on the sealings themselves and their role at Akrotiri; their broader significance and possible interpretations are reserved for Chapter 4.

The Findspots of Sealings at Akrotiri

The sealings were found in three different localities at Akrotiri; two of these are, however, adjacent rooms of the same building unit (*Fig. 43*). As previously stressed, the contexts of the two rooms and the sealings themselves do not allow us to make a specific connection between the unique sealing and the Linear A tablets in Room D18a on the one hand, and the hoard of sealings in Room D18b on the other. Still, it would probably be wrong to ignore the fact that the two rooms belong to the same building unit, Delta-East; the unit is fully excavated, we therefore have a relatively complete picture of its architecture, dating, contents and organization.

Since one more sealing was recovered elsewhere in the settlement and appears to have originated in yet another building, we can at least eliminate the possibility that Delta-East was somehow special or unique at Akrotiri: there appears to be no reason to exclude future retrieval of sealings from different parts of the settlement. The majority of buildings brought to light so far at the site seem to have been residential buildings, which also hosted craft activities. Some of these may have been practised at a level that could, *muta-*

tis mutandis, be termed industrial, with weaving being a case in point; another activity posited for certain rooms of these buildings is that of exchange hubs. The only building (among the excavated ones) that stands out on the basis of architectural, iconographical and archaeological evidence in general is Xeste 3, which seems to have functioned on both a 'public' as well as a 'ceremonial' level.

Delta-East, despite its small size, has the characteristics of a residential building. It follows the architectural arrangement of the other typical, two-storey urban buildings and exhibits architectural autonomy from the rest of Complex Delta (Δ) with its own entrance. As far as interior arrangements are concerned, it has a mill-room, which is evidence that food preparation took place there. One of its ground-floor rooms was decorated with wall paintings, an exceptional instance at Akrotiri; but it is impossible to say whether this distinguished it from other residential buildings, which all had a room with wall paintings on their first floor.

THE SEALINGS AS PARTS OF PRODUCT EXCHANGE TRANSACTIONS

There is one facet, however, of building unit Delta-East, that has not been addressed by previous research so far, namely a further, potential function as a centre for product exchange. An argument in favour of such a function would be the impressive quantity and variety of objects stored hastily in Room D18a as well as in Room D2. Both these rooms seem not to have been damaged by the devastating pre-eruption earthquake and they therefore served as emergency storerooms. Assuming that, aside from structural autonomy, the building unit was also functionally autonomous from the rest of Complex Delta (Δ), our best bet is that the stacked objects derived from within the same building unit, with the sole potential source of the objects being Room D21. Room D21 was the focal point of circulation for the ground floor of the whole unit and its largest room with a central column. But it was also the one that functioned as a contact point with the outside world, since it was provided with a large window in a fashion similar to Rooms D16 in Delta-South and A1 in Complex Alpha (A). It was also the first ground-floor room to be accessed after one entered the building; a similar pattern can be observed for Room D16 and Room A1, with the only difference being that in those units a small space immediately after the entrance hosted milling installations. In the case of Delta-East the mill-room D18a was accessed after one passed through Room D21; access to Room D21 was therefore unmediated after one entered the unit. But the division of Room D18 into two 'compartments', one of which served as a mill-room, was an architectural arrangement introduced after the SDL; the original location of the unit's mill-room, if different from the present, is therefore unknown. It is also of importance to note that Delta-East had a relatively restricted size, thus interior arrangements may have been conceivably dictated by the absence of adequate space.

On this basis, the sealings in Room D18b and the Linear A tablets found together with a sealing in Room D18a could have been among the original contents of Room D21 and were put into the adjacent rooms when it was being cleared. This explanation seems plausible in view of the improbable micro-contexts in which these administrative documents were found: the sealing hoard was in a mill-room, and the tablets with the lone sealing inside an *asaminthos* ('bathtub'). But a rushed rearrangement of the rooms' contents on the ground floor after a strong earthquake could account for their unlikely whereabouts.

An explanation that sees Room D21 as a centre of exchange, in which sealings and tablets were assigned roles, would ideally be further accentuated by the discovery of the isolated *nodulus* in a box together with a balance set and weights elsewhere in the settlement (*Figs. 49–52*). The weighing set indicates that some kind of product exchange took place; in such circumstances the *nodulus* could scarcely have been accidental. However, the *nodulus* is altogether a different kind of sealing from the types of nodules found in Rooms D18a and D18b, and it bears the impression of a seal otherwise unattested at Akrotiri (*Fig. 61*). Thus a connection between the sealings of Room D18 and the *nodulus* found in the box with weighing set cannot be posited on the basis of the sealings themselves.

THE SEALINGS AS ARCHIVAL DOCKETS

The potential involvement of sealings with product exchange transactions does not preclude other functions for the same sealings. A role purported for all the sealings in Room D18b is an archival one. The question is not only whether a room of a building served as an archive, assuming an exclusive function of that sort can be posited for any room, but whether the sealings had assumed their final role as archival dockets.

The question of what constituted an archive in the second millennium BC Aegean is a complex one. Archives, in the sense of rooms to which this specific function was assigned, are thought to have existed already in Protopalatial Crete at Petras, Malia, Phaistos and Monastiraki.[688] Script documents and/or sealings are believed to have been kept and/or made on the spot in specific rooms; in the cases of Phaistos and Monastiraki, the main function of the archival room would have been the collection of sealings, which at Monastiraki were not even accompanied by Linear A tablets.

Linear A tablets appear to indicate that the recording as well as the storing of financial transactions was carried out in different localities within a settlement during the Neopalatial period, a suggestion seemingly valid for some of the larger sites.[689] At minor sites it is thought that emphasis was placed on registrations in storerooms and workshops; if archival spaces had existed, they await discovery. The concept of 'minor archives' has even been proposed, where a few tablets are found together with a restricted number of other administrative documents[690].

Archival rooms are also known from the Mycenaean period, as rooms where Linear B tablets were kept, sometimes together with sealings;[691] no exclusive sealing archives are thought to have existed in the Mycenaean world. More refined observations have been offered for archival rooms in the palace of Knossos, where different scribes were active in different localities of the palace, leading to their characterization as an 'office' rather than

688 Petras: Tsipopoulou – Hallager 2010; Malia: Poursat 1990b; Phaistos: Fiandra 1968; Monastiraki: Kanta – Tzigounaki 2000.

689 Hallager 1996, 32; Schoep 1999b, 205–06.

690 Hallager 1996, 32.

691 In Pylos: Blegen – Rawson 1966, 92–100. In Knossos: Olivier 1967. *Pace* Driessen 1994–95, 244–45, who considers clay tablet deposits as 'pre-archives', temporary collections of administrative data that were destined to be transferred to other media, probably of perishable material.

a simple storage area.[692] It has been suggested that Archive Room 7 at Pylos also served as 'the office of the tax collector', but its principal use was that of tablet storage.[693]

The retrieval of bronze hinges with the sealings in Room 18b can be compared to other findspots of bronze hinges in Crete and the Greek mainland. It appears relatively safe to suggest that sealings were kept in boxes within the archives, a suggestion which makes sense on account of their small size; sealings would have easily been misplaced or lost if not gathered in a container. This observation is valid for the flat-based nodules, but could also have applied to hanging nodules, assuming they were not, or no longer, attached to the commodities themselves.

Regarding the existence of wooden boxes in association with sealings, a further suggestion can be extracted from the Akrotiri sealings. Since the stamped nodules had come to Akrotiri from elsewhere, it is very likely that they were also transported in a box or boxes. In truth, we have absolutely no idea how frequently or in what quantities sealings were dispatched: they could have reached Akrotiri singly or in groups with different shipments joining previously-sent nodules in a box, or they could have arrived all together. The suggestion that sealings could also have been transported in boxes is further reinforced by the retrieval of a *nodulus* inside yet another wooden box, which also contained a balance set.

A last note is reserved from what was observed in previous studies, but seems to also be verified by the Akrotiri evidence, namely the possibility that flat-based nodules, the prevailing variety of nodules among the Akrotiri batch, were most likely left unopened upon arrival.[694] As much as such an assumption defies our logic by undermining their presumed purpose of existence (documents dispatched with a written text that was not meant to be read [?]), there are parallels from the ancient world which demonstrate that such a practice was not unheard of. The most pertinent parallel appears to be that which is attested in southern Mesopotamia during the Old Babylonian period (c. 2000–1600 BC) and refers to a practice of enclosing clay tablets in a clay 'envelope', which would subsequently be stamped. The tablet contained information of legal nature (such as contracts) and was kept enclosed in the envelope until a dispute arose, in which case it was opened and consulted.[695]

A similar function has been posited for hollow, clay balls of various sizes containing clay counters or tokens, recovered in various areas of Mesopotamia from the mid-fourth millennium BC onwards; these bear seal impressions on their exterior and have also been termed as 'envelopes'. They are thought to represent an early administrative device, one that could be opened by breaking if the contents were contested.[696]

692 Olivier 1967.

693 Blegen – Rawson 1966, 92–93.

694 See above, p. 94.

695 Renger 1977; Leemans 1982, where the importance of witnesses to the transaction is stressed, who sometimes certified to the contents of the document by stamping with makeshift seals, manufactured on the spot for the occasion.

696 The theory was promoted by Schmandt-Besserat (1992), but has been contested in its details; see more recently Woods 2010.

The Function and Role of Sealings at Akrotiri

The Cretan sealings retrieved at Akrotiri testify to almost all Minoan Neopalatial sealing types: flat-based nodules, single-hole and two-hole hanging nodules, direct nodules and *noduli* (*Figs. 56–61*). Only roundels are absent, but whether this is accidental or not is unknown. The retrieval of these Cretan sealings at Akrotiri constitutes *de facto* evidence either that these sealing types were intended for dispatch from one site to another, or that sometime after their manufacture they were candidate travellers. At present there is nothing to suggest that their dispatch from Crete to Thera was an exceptional phenomenon, since the sealings themselves present nothing out of the ordinary compared to their counterparts retrieved in Crete.

The examination of their findspots at Akrotiri indicates, however, that the sealings could have served more than one role: besides travelling documents, either self-sufficient or accompanying travelling goods, they may have participated in product exchange processes, and they finally seem to have assumed an archival role. It appears, therefore, that there could be many answers to questions regarding the character and function of these sealings, and that the biographies of these objects cannot be covered by a single explanation.

flat-based nodules and technical observations

Previous research, conducted primarily during the 1980s, i.e. the decade before the Akrotiri sealings were discovered, concluded that flat-based nodules were in fact document sealings: they were made solely for attachment to folded leather documents. Almost from the outset, there was no doubt that the process involved thin, folded pieces of leather. The Akrotiri evidence makes abundantly clear that the folded piece of leather could not have contained anything (hence the rejection here of the misleading terminology 'packet sealings'). Instead the piece of leather was simply folded onto itself several times.

The repeated examinations and exhaustive photographic documentation of the Akrotiri flat-based nodules by the author have lead to a number of observations pertaining to the technical side of the nodules' manufacture (*Figs. 54–56*). By counting from the Malia palace deposit that dates late into MM III, where the first securely-dated flat-based nodules appear, the Akrotiri flat-based nodules were probably produced within the first 100 years of flat-based nodule history in Crete, and are thought to precede the main bulk of the comparable Cretan evidence by some 80–120 years. Nonetheless they already attest to a standardization in how they were made, which was by no means simple or self-evident. Allowing for minor differences from one example to the next, not unexpected in hand-made objects, the fact is that they were all made according to certain principles. These manufacturing principles seem to be well established and fairly strict, since some of the nodules are like identical siblings; such a result which can only be achieved if the manufacturing process is: a) taught; b) obligatory; c) established because it already has a history.

The question as to whether sealings were made by the person/people that stamped them is so far unresolved. When two stamping partners are involved, or even three, as is often the case at Zakros, we must assume that the nodule itself could only be made by a single person. So it was either one of the stamping partners, or some other individual responsible

for folding the piece of leather, then placing the layers of clay on top and around the sides of the folded piece of leather, while continuing to wind the string, and finally inviting the stamping partners to execute their duty. In addition, the role of the person who had written on the piece of leather in the first place is in no way detectable in the sealing process.

This entire small 'ritual' was very repetitive, supporting the view that the process of making nodules was taught. Much like the manufacture of clay tablets, as well as writing itself, presuppose the existence of scribal school(s), the know-how for making clay sealings seemingly belonged to some sort of taught process. Stamping *per se*, of course, especially if guided by someone experienced in how clay behaves and dries, did not require any particular level of technical expertise or intellectual capacity. But if we assume that stamping implied a certain degree of administrative responsibility, even the stamping partners could not have been mere instruments in the process: they would have had to know how and why the process functioned.

The second element that derives from the technical observations on the flat-based nodules is that the manufacturing process was repetitive probably because the system in which it functioned was strict in its requirements. If someone is responsible for the same tedious and, in all probability, monotonous process, the only reason to be careful and precise in its repetition is that this is exactly what is required of them. This is why the Minoan administrative system has repeatedly emerged in this study as meticulously organized: the Akrotiri evidence shows a full-fledged system functioning accurately in its smallest details.

An additional observation concerns the size of the documents that were attached to a flat-based nodule. The Akrotiri evidence demonstrates in a number of cases the full extent of the folded piece of leather. By combining observations from nodules **N4**, **N18**, **N21** and **N24** it is evident that the leather document was folded at least twice in different directions. In this respect, the largest folded piece of leather present at Akrotiri measured 2.3 × 1.5 cm and was kept under nodule **N24**, therefore the leather piece would have been 4.6 × 3 cm when unfolded. One of the smallest pieces of leather attested measured 0.8 × 1.2 cm, measured under nodule **N48**, therefore it would have been 1.6 × 2.4 cm when unfolded.

Consequently, the sizes of the original leather documents appear to have been quite small. Depending on the size of the signs written on them in ink, the texts recorded could not have been lengthy.[697] These dimensions of text carriers are, however, reminiscent of contemporaneous Linear A tablets (*Fig. 119*); thus the leather documents, before folding, would have been comparable in size to clay tablets.[698] Although we will probably never recover any of the leather documents that were sealed by the flat-based nodules, it is not unreasonable to think that the contents may have been comparable to those on clay tablets, namely texts of a financial nature in tabular arrangement. The limited size of the leather documents rules out extended texts, such as legislative and legal documents, contracts, letters, poetry or literature and the like. Whatever these documents recorded, the texts were certainly extremely succinct and even telegraphic, much like those on Linear A tablets. What is probably beyond doubt, although equally non-verifiable, is that the texts on leather were written in Linear A.

697 *Pace* Perna 2017, who suggested through experimental methods that even lengthier texts could have been accommodated.

698 Hallager (1996, 137–45) discusses various possible leather sizes ranging from 'even smaller than the average size of a Linear A tablet' to 'large pieces of parchment'.

With regard to the size of the documents, this seems to correspond to the size of the flat-based nodules placed on top of them, as well as the size of the seals used: somehow they seem to have been interrelated. Since the starting point for the whole process was in fact the piece of leather, it could be that it was the leather document with its specific size and, therefore, its specific text length capacity that dictated the rest.

Another point for discussion is how and if the subtypes of flat-based nodules, as defined so far in the literature, are meaningful or useful when it comes to understanding and analysing flat-based nodules. The typologies devised in previous studies have provided little help in the present study, since they fail to address vital questions regarding flat-based nodules, including what each type represents. The existing typologies are correct in that they recognize certain repetitive traits in the manufacture of flat-based nodules, but do not offer satisfactory interpretations for their occasional presence or absence. For this reason an altogether different approach was adopted here; the results will be set out in Chapter 4, since they proved useful for understanding Neopalatial flat-based nodules in general.

THE REMAINING CATEGORIES OF NODULES AT AKROTIRI

Single-hole hanging nodules have always been considered as archival documents (*Fig. 57*). The discovery of nodule **N69** among the hoard of clay nodules in Room D18b at Akrotiri appears to confirm this assumption, since it is difficult to see the documents accumulated there as having any other function. There is no way of telling from the Akrotiri evidence whether this nodule had, at an earlier point in time, served another purpose, namely as a tag, as is often suggested in previous research. In archives elsewhere the seals used to stamp single-hole hanging nodules have also been used on other kinds of sealings, namely roundels, two-hole hanging nodules and flat-based nodules. The Akrotiri material offers no assistance on the matter of potential overlaps between the first two categories: no roundels have been found at Akrotiri, and the unique two-hole hanging nodule found is missing its impressed part; and as far as flat-based nodules are concerned, the seal used for stamping the unique single-hole hanging nodule at Akrotiri is not attested on any other nodule at Akrotiri or elsewhere. Yet the apparent overlap between impressions on single-hole hanging nodules and flat-based nodules evidenced in Cretan archives is of major importance: the evidence from Knossos and Agia Triada shows that the same seals could be used on both varieties, with some of the seals used for the flat-based nodules being indicative of a high administrative status.[699] So, although the impression on the Akrotiri single-hole hanging nodule does not coincide with that on any flat-based nodule, it cannot be excluded that it represented the certification of a transaction by a high-ranking official. The fact that the partially preserved impression on this single-hole hanging nodule derived from a hard stone seal with an intricate figurative scene could be of some significance in this respect.

Very little can be said about the unique two-hole hanging nodule **N70**, especially since it is missing the seal impression (*Fig. 58*). Basically, the only fact that can be stressed is its actual presence at Akrotiri among the nodules from Room D18b. The information in previous research is not very helpful either towards understanding its eventual function or degree of importance.

699 See Chapter 4, pp. 192–94, 203–10 and *Figs. 106, 112*.

The remarkable typological similarity of the direct sealing **N74** with another one retrieved at Agia Triada reinforces the idea of the uninterrupted, and probably quite conservative, continuity in administrative practices between LM IA and LM IB (*Figs. 59, 60*). In addition, the fact that the specimens from Akrotiri and Agia Triada were both made by following exactly the same sequence of movements, which produced the exact same shape of a nodule, also supports the idea of a taught manufacturing know-how, as previously suggested for flat-based nodules. Moreover, the discovery at Akrotiri of a direct sealing that was apparently made elsewhere definitively puts to rest the unfounded assumption that direct Neopalatial nodules were solely intended for on-site procedures, as believed for their presumed predecessors, the Protopalatial direct sealings.

Lastly, we have *nodulus* **N75**, a stamped clay nodule with no means of attachment to an object or cord, a 'sealing that sealed nothing' (*Fig. 61*). Although the *nodulus* is regarded in the literature as a token that changed hands, it appears to be implicitly treated in publications as an archival, therefore local, document wherever it is found. But the example from Akrotiri was found in a context that has little to do with archiving: it seems that the *nodulus* was required in a transaction that involved the weighing of products, which were possibly in the process of being exchanged. If the *nodulus*, according to the interpretations offered so far, functioned as some sort of token, i. e. as evidence of some kind of exchange, the next question is how this evidence worked. The piece was evidently prepared elsewhere, since it also seems to be made of non-Theran clay, and arrived at Akrotiri as such, to be given out probably in exchange for some product. Alternatively, it may be that the *nodulus* had already changed hands and had been collected by someone who was in possession of the box and the balance set. Either way we must accept that what made this simple clay lump valuable and, in all probability, recognizable, was the seal impression, which served as a guarantee for someone not present at the transaction. At a future instance the person receiving the token would have to redeem it where its face value, based on the impression, would be understood, or even claim some compensation from the original seal holder. In any case the *nodulus* was probably redeemable within the confines of a system where Minoan administrative insignia were known and valued.[700]

An alternative explanation is the possibility that the *nodulus* was not meant to change hands, but was meant to guarantee or authenticate something merely by showing it.[701] Again, this presupposes that the seal impression was recognizable and trustworthy, but this prerequisite was probably valid for any system that made use of seals for administrative purposes. Instead of the seal bearer travelling and being present at all potential transactions of interest, the seal bearer could provide assistants or representatives with a token of his authority, namely the impression of his seal on a clay lump, to be shown when and if necessary.[702]

700 See also the discussion in Panagiotopoulos 2015, 279–81.

701 Krzyszkowska 2005a, 163.

702 Specific evidence for such function of stamped objects as a sort of passport comes from the Persepolis Fortification tablets (early fifth century BC). Such a pass, a stamped clay document, is named *halmi* in Elamite and *miyatukka* in Persian (Lewis 1994, 27).

The Iconography of the Sealings

The sealings retrieved at Akrotiri were a minimum of 69 specimens and they testify to the use of 19 different seals (*Fig. 62*). In accordance with Neopalatial sealing deposits in Crete, the Akrotiri evidence testifies to the recurring use of a limited number of seals on numerous sealings. Again, it should be stressed that we are missing all information on the time span involved in the formation of such sealing deposits, and are thus in no position to evaluate properly what precisely the repetitive use of certain seals means. For the sealings retrieved in specific deposits in Crete and regarded as evidence of on-site administrative procedures, such repetitive use has been interpreted as an 'intensive' model of seal use, presumably exercised by resident seal owners; minimal use of seals in the same deposits has been viewed as the result of incoming sealings.[703] Even if valid at Knossos, for which the theory was proposed, it cannot be applied here, since all sealings found at Akrotiri are, by definition, incoming. Alternative explanations should therefore be sought for the seemingly frequent use of some seals and the seemingly rare use of others, most notably explanations that will also allow for the randomness of preservation of materials in the archaeological record.

All seals are Minoan Neopalatial products; eight most likely came from metal rings, in all probability gold,[704] and seven were made of hard stones;[705] in one case the original material, whether metal or stone, cannot be determined.[706] The quality of craftsmanship is outstanding in most instances and the seals would have ranged among the finest examples of Minoan Neopalatial glyptic. The metal rings were all used for flat-based nodules, except for one that was used on the *nodulus*; the unique single-hole hanging nodule and the unique direct nodule bore the impressions of stone seals, still of no lesser artistry. Most seals used for the Akrotiri sealings bore figurative motifs, as was typical of Neopalatial output, where 'ornamental' motives had all but disappeared; only one seal is decorated with an abstract, geometric design, a 'tectonic' motif.

Akrotiri attests to the impressions of a metal signet ring, in all probability gold, with a chariot scene. The very same ring was subsequently used to stamp flat-based nodules recovered at Agia Triada and Sklavokambos in Crete, both destroyed in LM IB (*Figs. 63, 106*). It is known, therefore, that this ring was used in Minoan administration between LM IA and LM IB, if not continuously, at least repeatedly. Whatever the significance of the chariot scene as a seal motif, it gives the impression of rather limited usage. On present evidence at least, apart from this particular ring — attested through impressions at Akrotiri, Agia Triada and Sklavokambos — only one other, bearing a griffin-drawn chariot, is known

703 The theory proposed in Weingarten 1988, 11–14; the more recent discussion on the matter in Panagiotopoulos 2014, 43–44.

704 'Chariot scene': *CMS* V Suppl. 3 no. 391; 'bull-leaping': *CMS* V Suppl. 3 no. 392; 'bull-leaping/grappling': *CMS* V Suppl. 3 no. 395; 'building and bovines': *CMS* V Suppl. 3 no. 404; 'galloping lion/griffin/dog': **N75**; 'procession': *CMS* V Suppl. 3 no. 394; 'man': *CMS* V Suppl. 3 no. 399; 'scene at a tree': *CMS* V Suppl. 3 no. 400.

705 'Couchant bull': *CMS* V Suppl. 3 no. 398; 'lioness attacking bovine': *CMS* V Suppl. 3 no. 401; 'animal device': *CMS* V Suppl. 3 no. 393; 'pair of dogs': *CMS* V Suppl. 3 no. 396; 'lion and griffin': *CMS* V Suppl. 3 no. 402; 'heraldic griffins/sphinxes': *CMS* V Suppl. 3 no. 403; 'tectonic design': *CMS* V Suppl. 3 no. 397.

706 'Flying bird': *CMS* V Suppl. 3 no. 405. The three remaining are too fragmentary to allow any such evaluation.

from a sealing in the Eastern Temple Repositories. In other words, only two rings with the chariot theme are known to have been administratively active in the Neopalatial period.

The discovery of seals depicting chariot scenes in Mycenaean contexts, particularly those of early Mycenaean phases, points to the establishment and consolidation of a Mycenaean 'character' from the Shaft Grave period onwards. This was assisted by, *inter alia*, the selective appropriation of an ideology-laden and emblematic Minoan visual vocabulary;[707] the exclusive status of chariot scenes in Minoan Crete would fit this picture. The importance of the theme is further highlighted by its attestation on a sealing at Pylos, at a time quite distant from the influence of Minoan Neopalatial glyptic. Also notable is the Mycenaean afterlife of the theme, when it was further diffused into wall paintings and pottery.[708]

The limited edition of rings with chariot scenes for administrative purposes stands in stark contrast with the ubiquity of bull-related themes in both Minoan Neopalatial glyptic and among the Akrotiri sealings: five different rings with bovines, most of which were bulls, were responsible for the impressions of a staggering 77% of the Akrotiri sealings (*Figs. 65–70*). But it is also worth stressing that six different motifs, all coming from metal rings, included another frequent theme, namely the human, male figure (*Fig. 62*); betweem them, these seals stamped a non-negligible 76% of the Akrotiri sealings. The latter percentage concurs with the numbers extracted from previous studies, which established a special relationship between figural motifs on metal rings, i. e. human figures or deities in human guise, with flat-based nodules, such as the overwhelming majority of the Akrotiri sealings are.[709]

The most impressive bull-leaping scene derives from the largest metal signet ring used for the Akrotiri sealings. Its bezel measured 3.3 × 2.4 cm and is among the largest Minoan metal rings known to have existed and used for administrative purposes (*Figs. 65–66*). We cannot say whether the administrator who used this signet ring was more important than others on account of the high number of impressions (s)he generated, but (s)he was certainly one of the busiest and versatile at the time.[710] Its particular theme is well known through multiple impressions of some 17 different seals from sites around Crete: Agia Triada, Gournia, Sklavokambos, Zakros, Knossos, Chania; i. e. from virtually all the sites where Neopalatial sealings have been found. According to the evidence to date, the specific ring responsible for the Akrotiri impressions was not used for sealings found elsewhere; but two extremely similar bull-leaping rings impressed sealings that were found in the same contexts at Agia Triada, Gournia and Sklavokambos, and one that was found in the Zakros palace (*Fig. 66*).[711] The bull-leaping theme was, therefore, one of the most extensively and persistently copied for Neopalatial administrative purposes. It was not as 'exclusive' as the chariot scenes, at least not on present evidence, but its repeated copying was undoubtedly

707 A complex process which has been examined in different sets of material remains, such as mortuary practices and architecture (Voutsaki 1999; Wright 2006).

708 Krzyszkowska 2005a, 140–41.

709 Tsangaraki 2010b, 371, fig. 6.

710 The variant frequencies of seal impressions have prompted Militello to posit different roles for the people who handled them in the Protopalatial Phaistos deposit (2000, 227–28), and Relaki to ponder on their possible different types of authority (2012, 307).

711 See Chapter 4, pp. 192–94 and *Fig. 106*.

meaningful.[712] Among the Akrotiri material, impressions from a small-sized metal ring, probably of gold, with the motif of a man trying to grapple a bull is also attested (*Fig. 67*). Other seals bore further bovine iconography: a *couchant* bull from a hard stone seal, a motif which could have been extracted from a broader attack or hunting scene (*Fig. 68*); a lion attacking a bovine, one of the earliest attestations of lions pursuing other animals, such as bovines, gazelles, agrimia, etc. (*Fig. 69*); and two bovines next to a two-storey building, a combination of a built environment with bovines both unique and peculiar (*Fig. 70*).

From the rest of the animal kingdom, a hard stone cushion with the motif of two fighting dogs is attested (*Fig. 71*). Another hard stone cushion bore a pair of standing dogs looking in the same direction (*Fig. 72*). The impression of a metal or stone seal has two flying birds with open wings (*Fig. 73*). Three more seals attest to a lion, as well as lion-inspired mythical creatures: a lion and griffin (*Fig. 74*); a pair of heraldic griffins or sphinxes (*Fig. 75*); and the rear half of a running animal, which may have been a lion, a griffin or a dog to judge by its curling tail (*Fig. 76*).

A cult scene came from a small metal ring (*Fig. 77*): a man wearing either a robe or a 'sacral knot' holds a double axe and stands in front of a frieze of running spirals. The man accords with a series of processional scenes in Minoan iconography, in which the participant(s) carry cult equipment. Another solitary male figure occurs; the circumstances in which he appears are unclear, but he holds a staff under his armpit (*Fig. 78*). The last of the male figures is involved in a complex hunting scene, in which a dog bites its fallen prey, while the man turns his attention toward what could be another victim (*Fig. 79*).

The only seal with a non-figurative theme among those used for the Akrotiri sealings bears a 'tectonic' motif (*Fig. 80*). This type of motif appears to have peaked primarily at the late Protopalatial–early Neopalatial period; hence the seal could be regarded as slightly 'antique' given the date of Akrotiri hoard. Indeed this is the only seal which may predate LM I, unlike all others used on the Akrotiri sealings.

712 In the modern scholarly subconscious the bull-leaping motif is so closely associated with Minoan culture, that its discovery in contexts outside the Aegean immediately brings to the fore comparisons with the Minoan world; see Syrian seals (Collon 1994), Egyptian wall paintings (Morenz 2000), and, more recently, bull-'dancing' on an early Hittite relief vase from Hüseyindede Tepesi in central Anatolia (Sipahi 2001). See also further below, Chapter 4, pp. 190–92.

CHAPTER 3: THE IMPRESSED OBJECTS

Only three objects with seal impressions have been found at Akrotiri, an exceptionally small number by any standards. Apart from their fragmentary state of preservation, **I1**–**I3** have nothing in common. All three were made for purposes other than bearing seal impressions: a discoid loomweight, a pithos rim and what was possibly a melon-shaped loomweight. Since such objects could have existed without seal impressions, they stand in marked contrast to the imported sealings, which were created with the express purpose of carrying impressions. In consequence, these impressed objects merit a separate chapter.

It is likely that the small number of stamped objects offers a true picture and is not fortuitous. Indeed, more than half of the sherds from the Akrotiri excavations have been sorted[713] and no impressed pottery has been found, apart from the fragmentary pithos rim **I2** (*Figs. 90–91, 94*).[714] In addition, all loomweights have been recorded and are under study,[715] including loomweights from layers earlier than the VDL,[716] and no stamped specimens have been recovered apart from the discoid **I1** and the possible melon-shaped **I3** (*Figs. 89, 92, 93, 95*).[717] At present, the rarity of impressed local objects suggests that the inhabitants of Akrotiri were unfamiliar with the practice of stamping,[718] a matter which will be discussed further below.

Another possible carrier of a stamped impression has been reported at Akrotiri.[719] This unusual object, an orange-coloured lump of ochre in the shape of a cylinder weighing 2200 gr, bearing the imprint of a textile in which it was probably wrapped,[720] also carries a seemingly rectangular imprint, possibly the impression of a stamp.[721] The cylinder dates to the EC period and was found inside one of the underground rock-cut chambers. Since seven stone tools related to the processing of raw masses of pigments were found in association with the cylinder, the debris could have come from a workshop. However, the rectangular imprint preserves no motif, so its identification as a stamp impression remains highly uncertain. Consequently, the possibility that the ochre cylinder could have been imported stamped to Akrotiri, however appealing, is at present dubious.

713 All the pottery from the excavations of the new shelter pillar pits (1999–2003), the West House, Building Beta (B) and Complex Delta (Δ) has been sorted. The Xeste 3 pottery is currently being sorted, but in any case this building has a relatively small quantity of pottery (Papagiannopoulou 1995). I thank I. Nikolakopoulou for the above account.

714 Karnava – Nikolakopoulou 2005.

715 Tzachili 1997, 183–93; Tzachili forthcoming.

716 Tzachili forthcoming; Vakirtzi forthcoming.

717 The loomweights that have been recorded are those discovered during excavation and removed from the site; some were however left *in situ* in the rooms where they were found.

718 Karnava 2016a.

719 I thank A. Devetzi and K. Birtacha for bringing this find into my attention and for discussing its peculiarities and possible interpretations. The piece was examined by the author and M. Anastasiadou in August 2013.

720 Devetzi 2009–10, 40, fig. 10; Birtacha *et al.* forthcoming.

721 Imprint dimensions: 6.6 × 3–4 cm.

THE CONTEXTS: ROOM D4 AND OPEN-AIR SPACES

Stamped object **I1** was found in the interior of Delta-North, while **I2** and **I3** were recovered from debris accumulated in open-air spaces.

Delta-North, D4

The fragmentary discoid loomweight **I1** was found in Room D4 during the 1970 excavation season (3/9/1970), when most of Complex Delta (Δ) came to light.[722] At the time, the room was designated the 'Xeste ante-chamber' in the daybook, since it was thought that Complex Delta (Δ) was another ashlar building. Room D4 is in fact the E part of Room D4–D5, from which access was gained to the rest of Delta-North, including its first storey, through various and complicated routes (*Fig. 81*).[723] No partition wall between the two sections of the ante-chamber seems to ever have been found, but the fact that the stone pavement of the floor of Room D5 was found in place makes the theoretical separation certain. By contrast, in Room D4 the floor had sunk to below ground level and the excavation never reached bedrock. It has been suggested with good arguments that Room D4 also had a first floor, which was found collapsed inside the very same room; consequently, during excavation movable finds were recovered at various levels, rarely in place, mixed with pumice, river debris and soil.[724]

The excavation inventory book describes the object as having been found in the 'deposit above the sunken floor' of D4. The information derived from the *Praktika* report for that year, combined with the daybook entries, describes the finds of D4 in layers. The first storey contents were represented by an intact nippled ewer 'amidst fragments of other vessels';[725] a layer of pumice intervened between the pots and the floor. Under the floor was 'an abyss of pumice, sand, jars, amphorae and other fallen matters on the sunken floor (of the basement) which we haven't seen as yet …'; there followed 'a group of well-preserved vessels, almost exclusively ewers', among which was an inscribed one (*Fig. 82*; detail of the inscribed vessel in *Fig. 83*).[726] The daybook mentions that these vessels were found resting at a depth between –1.4 m and –1.75 m 'from the top of the E wall', whereas beam holes, which would have supported the floor, were found at –1.30 m. At about the same depth, meaning that the investigation was continuing in different sections of the same space, two more vessels are mentioned, along with an animal tooth and loomweight **I1**, which was probably recorded in the daybook due to its impression. Further below, at a depth of –1.9 m, more pumice was revealed, and a layer of soil appeared by the SE corner containing numerous animal bones and a small stone tray of unknown precise function. At –2.2 m were red plaster fragments and two conical cups, but fragments of many more were recovered, along with a goat horn and a stone vessel. At –2.45 m, which seems to be the ground

722 *Thera* IV, 10–28, plan I. On the seals retrieved in various rooms of Complex Delta (Δ), see Chapter 1, pp. 25–38; on the impressed nodules retrieved from the same building complex, see Chapter 2, pp. 83–94.

723 Michailidou 2001, 304–33; Palyvou 2005, 80–83.

724 *Thera* IV, 14; Michailidou 2001, 306, 331, 333.

725 *Thera* IV, 14. The references to a 'glandular bead of carnelian' and 'another lentoid of steatite' are probably an oversight (see Chapter 1, for the discussion regarding seal **S9**).

726 *GORILA* IV no. THE Zb 2.

Fig. 81. Delta-North: Room D5–D4 and the main staircase during excavation in 1970 (Akrotiri Excavations Archives).

level floor made of beaten earth, there were fragments of a bronze pin, another stone vessel and a loomweight.

Commentary: Amidst all the rubble it is unclear whether the ewers and the loomweight **I1** belong to the equipment of the first or the ground level of Room D4. It is more likely, however, that they came from the first floor, inasmuch as they were found at a considerable height within the ground level, with more pumice beneath them. Had they belonged to the ground level, the only explanation for their location would be that they had been lifted by water. In that case, we should probably not expect to find a concentration of ewers, which on present evidence does not appear to be accidental. The large number of ewers could indicate a storage area; this interpretation is only preliminary, however, and needs confirmation through the on-going study of pottery from Complex Delta (Δ).[727]

Open-Air Space to the S of Xeste 2 (NPP 64A)

The fragment of the local pithos rim **I2** bearing multiple impressions of the same seal was discovered in 2000 in NPP 64A, which was opened in the area immediately to the S of Xeste 2.[728] The area was previously thought to have formed part of the interior of Xeste 2, and all the topographical plans of the site still show it as part of the Xeste building.[729]

727 Mathioudaki – Nikolakopoulou forthcoming.

728 Karnava – Nikolakopoulou 2005.

729 See, for instance, the latest architectural study of the site, where Xeste 2 is mentioned as a 'most probably very large [building]' (Palyvou 2005, 96).

Fig. 82. Delta-North: Room D4, the *a-re-sa-na* group pottery *in situ* (Akrotiri Excavations Archives; *Thera* IV, pl. 1a).

Fig. 83. Delta-North: Room D4, the *a-re-sa-na* group pottery *in situ*, detail (Akrotiri Excavations Archives).

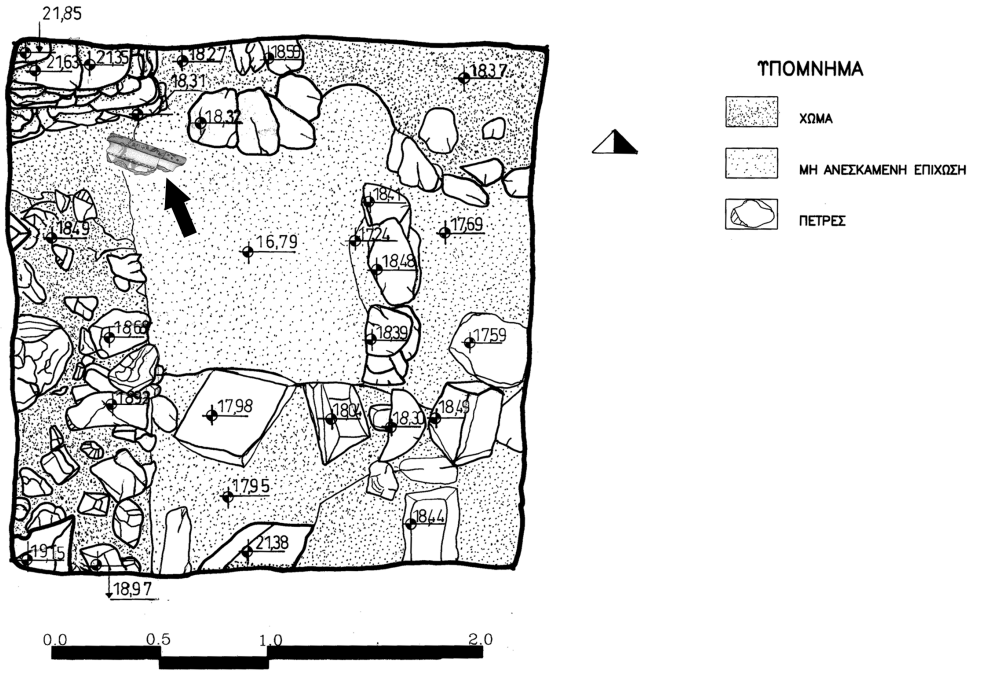


Fig. 84. Plan of NPP 64A with exact findspot of rim **I2** to scale (Akrotiri Excavations Archives, drawing by E. Damigou – K. Peleki, rim drawing and arrow added by A. Karnava).

Fig. 85. Pottery sherds from the debris in which rim **I2** was found (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

Removal of volcanic depositions, however, which took place before the beginning of the recent excavations for the construction of the new shelter, revealed the S wall of Xeste 2, which is actually to the N of NPP 64A. The pithos fragment was found outside the SE corner of yet another, previously undiscovered and still unnumbered, building. The space investigated in the confines of NPP 64A was considered an open area, at least in the latest pre-eruption phase.

The rim was found amidst LC I debris apparently resulting from a destruction, almost immediately under the volcanic depositions. The layer consisted of dark brown, hard soil, mixed with stones, which might have originally belonged to the new building to its NE (*Fig. 84*). Other finds in the same debris layer included numerous pottery sherds, animal bones, seashells, some obsidian flakes, a small stone ball, and a bronze object (*Fig. 85*).

Commentary: It is unclear where the debris excavated in this trench came from. The only information that can be extracted from the other objects discarded with the pithos rim is that the debris represents what was once a domestic context, destroyed by an event during the LC I period.

Open-Air Space to the N of a New Building, NE of Xeste 4 (NPP 62)

The impressed fragment of the clay object **I3** was found in 1999 in NPP 62. The excavation revealed what appears to have been the N wall of another newly discovered building to the NE of Xeste 4.[730] The wall, with a SW–NE orientation, appeared in the S part of the trench measuring 3.2 m in length and 0.7–0.75 m in thickness; it was revealed to a height of 3.6 m.[731] The thickness of the wall suggested that the building was preserved at its lowest level. The wall had a window measuring 1 × 0.7 m (*Fig. 86*).[732]

Object **I3** was found when debris outside to the N of this building was being removed (*Fig. 87*). Two consecutive layers of debris were detected. The sorting of the pottery provided a date for both layers in the LC I period, without further differentiation. Movable finds in these layers included large quantities of pottery sherds from all kinds of pots justifying the characterization of these layers as debris, numerous animal bones, stone tools, obsidian debitage, and metal slags. The *locus* in which **I3** was found consisted of brown, loose soil, with small stones and numerous pottery sherds, and was removed from the E half of the trench. It was the last *locus* belonging to the upper debris layer; under it lay the lower debris layer, of harder, greyish soil. The particular *locus* contained a considerable quantity of sherds, animal bones, obsidian debitage, seashells, and fragments of stone tools, which was more or less what both layers contained (*Fig. 88*).

Commentary: The origin of the debris in which the loomweight fragment was found is unclear. However, since it forms part of the extensive debris layers that covered the LC town streets and squares after what was probably a devastating seismic event, it is safe to suggest that it can be dated to a phase within the LC I period. In addition, the recovery of

730 *Praktika* 1999, 177–79, figs. 14, 15.

731 Investigation of the NPP stopped before reaching the bedrock, because of changes in the structural plan of the shelter.

732 *Praktika* 1999, pls. 115, 116.

Fig. 86. NPP 62: wall (SW–NE) with window belonging to a building to the NE of Xeste 4 (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

Fig. 87. NPP 62: debris to the N of a building situated to the NE of Xeste 4; photo taken on the day **I3** was found (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

Fig. 88. NPP 62: pottery from the *locus* in which **I3** belonged (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

metal slags in the rubble, together with the retrieval of a probable crucible fragment in the nearby NPP 61,[733] in a layer corresponding to the one in which **I3** was found, could indicate the prior existence of a metallurgical workshop nearby.

THE STAMPED OBJECTS: TWO LOOMWEIGHTS AND A PITHOS RIM

The Discoid Loomweight

The fragmentary discoid loomweight **I1** bears an almost intact and relatively well-preserved seal impression (*Fig. 89*). The fragment measures 6.7 × 5.05 cm and has a maximum thickness of 2.9 cm. The clay is of yellowish-brown colour, with a grey core and sizeable inclusions but no mica. Almost half of the original disc is preserved.

Loomweights are components of the warp-weighted loom, the main equipment used in the Aegean for weaving textiles from the Middle Neolithic period onwards.[734] Discoid loomweights were a typical Minoan loomweight shape, used from EM II to LM III. Apart from their distribution in numerous Cretan sites they have also been recovered outside Crete:[735] the list includes many Aegean islands,[736] as well as the western Anatolian coast,[737] but they are noticeably absent from sites on the Greek mainland until the LBA. Of par-

733 Erroneously reported in *Praktika* 1999, 179, as coming from NPP 62.

734 Burke 2010a, 430–35.

735 Cutler 2012, 146–47.

736 Aegina, Kea, Naxos, Melos, Thera, Kythera, Antikythera, Samothrace, Chios, Samos, Koukonissi near Lemnos, Rhodes, Kos, Karpathos, Kalymnos.

737 Troy, Iasos, Teichiussa, Çeşme-Bağlararasi, Bakla Tepe, Liman Tepe.

Fig. 89. Discoid loomweight **I1**; scale 2:3 (Akrotiri Excavations Archives/*CMS* Archive).

ticular interest here is the site of Agia Irini on Kea, where the introduction of this Minoan device *par excellence* was first noticed in MBA layers.[738] At Akrotiri this technology seemed only to occur in the VDL layers[739] but more recent evidence shows that discoid loomweights were present in older layers as well,[740] demonstrating that the technology had arrived earlier than previously thought.

None of the earlier Akrotiri samples show any evidence of stamping but one bears an incised inscription.[741] Loomweights with a single incised mark were thus far known from LC layers at Akrotiri,[742] but none was known to have been stamped or inscribed with a proper inscription until now. Whether single incised signs on the one hand, and stamps from seals on pottery and loomweights on the other, should be seen as interchangeable marking methods is unclear.[743]

Stamped discoid loomweights and varieties thereof are known from Palaikastro[744] and Malia (Quartier Mu[745] and Nu),[746] two of the better published sites in Crete; an unspecified number of stamped loomweights is reported from Monastiraki.[747] The dates of these specimens vary from the EM to the LM period.

Visual examination of **I1** indicates that the loomweight is made of the typical Theran, buff clay. Until proper petrological analysis is carried out, however, the matter is better left open.

738 Davis 1984.
739 Tzachili 1990; 1992, 140.
740 Knappett – Nikolakopoulou 2008, 5, where loomweights were found in a layer dating to phase C in the Akrotiri MBA sequence (for the MBA sequencing, see Nikolakopoulou *et al.* 2008). MC loomweights received a preliminary presentation, and a more detailed study is due (Tzachili forthcoming; Vakirtzi forthcoming).
741 Karnava forthcoming c.
742 Tzachili 1990, 385, figs. 8, 10.
743 Poursat 2001, 28.
744 *CMS* II,6 nos. 239, 245 (this also bears an incised double axe), 248.
745 *CMS* II,6 no. 202; Detournay *et al.* 1980, 204–06 no. 294; Poursat 2013, 94.
746 *CMS* II,6 no. 212.
747 Burke 2010b, 43.

The Inscribed and Stamped Pithos Rim

The three joining sherds of pithos rim **I2** were retrieved from the same fill. The fragment (13.5 cm in height, 35.6 cm in width, wall thickness 1.7 cm, rim thickness 4.5 cm) is part of the rim and the upper part of the body of a pithos, estimated as originally 1–1.2 m high. The mouth (internal rim) diameter is estimated as having been c. 37 cm (*Fig. 90*).[748]

According to Nikolakopoulou the fragment belonged 'to a pithos of ovoid type, with square-sectioned rim and three or four vertical handles of circular/oval section on the upper part of the body (the chipped attachment point of one handle is visible on the fragment), and possibly another three or four corresponding similar handles above the base. On the external surface of the fragment traces of the decoration are preserved, namely part of a horizontal relief rope pattern and black paint as part of a trickle pattern, both on the upper part of the body; traces of black paint are also found on the rim. It is certain that horizontal rope patterns or raised bands ran around the original (now missing) body of the pithos and trickle patterns were applied on the upper part of the body and the handles. According to visual examination the fabric is local (yellow/light brown clay with inclusions, slip of the same colour). The morphological features of the particular pithos type suggest an influence from contemporary Minoan prototypes, rather than the local Middle Cycladic tradition. Gas chromatography analysis for the detection of the contents (carried out in the laboratory of the School of Chemistry, University of Bristol) did not provide any fruitful results.'[749]

The particularity of this piece lies in the fact that it was stamped at least 13 times by the same seal: nine impressions on the upper horizontal surface[750] and four on the external vertical surface of the rim (*Fig. 91*). The impressions were applied at various stages in the drying process, since in some places they are clear and deep, and in others superficial and faint. The rim also bears an incised Linear A inscription, executed before firing on the external vertical surface.[751] It seems that the sequence of actions — including an 'accident' which caused partial deformation of the rim — was as follows: incision of inscription, followed by stamping of the seal impressions, followed by application of the paint, followed by the 'accident', ending with the firing of the pot. This stamped and inscribed pot is a unique piece, not only as far as Thera is concerned but also extending to Crete and beyond. No other example of a clay vessel that is both stamped and incised exists anywhere in the Aegean.

The practice of stamping pithoi or other vessels has a long history in the Aegean, going back to the EH/EC periods, when a decorative purpose is presumed.[752] Stamping of pottery is also attested in Protopalatial Crete, where something other than decoration may be implied by the occasional use of Hieroglyphic seals,[753] which were closely linked to the

748 Nikolakopoulou in Karnava – Nikolakopoulou 2005, 214.

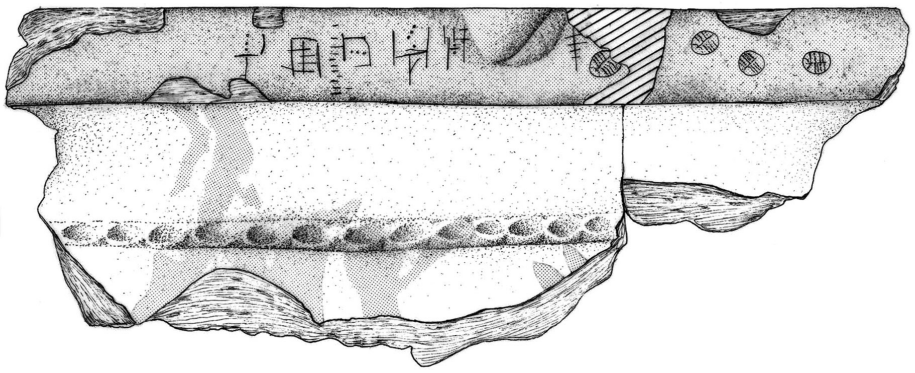
749 Nikolakopoulou in Karnava – Nikolakopoulou 2005, 214.

750 Some more impressions can be seen here and there on the upper horizontal surface, but they are too superficial to be counted.

751 THE Zb 13: Karnava – Nikolakopoulou 2005, 219–22; Boulotis 2008, 69; Karnava 2008, 378.

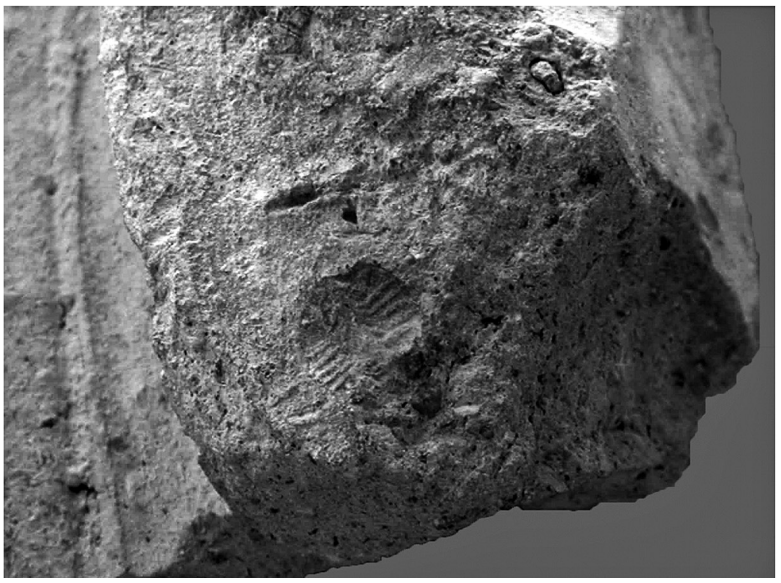
752 Karnava – Nikolakopoulou 2005, 223, with relevant bibliography.

753 All five instances dating to the Protopalatial period and all found on vessel handles, probably amphoras: *CMS* II,6 nos. 189 (Malia, Quartier Mu), 229–231 (Myrtos-Pyrgos); V Suppl. 1B no. 329 (Petras, Siteia).



I2

Fig. 90. Stamped and inscribed pithos rim **I2**; scale 1:3 (Akrotiri Excavations Archives, drawing by A. Kontonis; Karnava – Nikolakopoulou 2005, 218, fig. 3a).



I2

Fig. 91. Rim **I2**, with detail of a seal impression on the vertical rim surface (Akrotiri Excavations Archives, photo by C. Papanikolopoulos – D. Sakatzis).

Protopalatial administrative system.[754] In Protopalatial Malia a single pithos is attested with a seal impression on its rim, whereas various jars are impressed on their handles.[755] For such a limited practice, it is probably pointless to seek patterns or confirmation of the

754 Karnava 2000, 246.

755 Detournay *et al.* 1980, 200–04; among these, an impression by a Cretan Hieroglyphic seal, see above n. 753. The stamped pithos is of unspecified provenance (Poursat – Knappett 2005, 205 no. 120; *CMS* II,6 no. 204). Some fresh thoughts on jar impressions are now to be found in Weingarten 2015.

unfounded, and subconsciously held assumption that marking denotes some sort of ownership.[756] Again, in the case of Malia an indeterminate administrative function could have been at play when Cretan Hieroglyphic seals were used.[757]

Since the preliminary publication of **I2** in 2005, only one stamped pithos has been reported from Crete from the site of Papadiokampos in Siteia.[758] The pithos, which is dated by the excavators to MM II–III based on the typology of the seal impressions and the pithos rim section, was found in House B.1, destroyed in LM IB. Two different seal impressions, both most likely made by prisms, were stamped a total of 10 times on the pithos rim and the handle joints; the impressions could also have been from different sides of the same prism. This instance is the only significant parallel so far, since it involves a pithos still in use in LM IB.

The Fragmentary Possible Melon-Shaped Loomweight

The fragmentary object **I3** measures 6.65 × 5.65 cm and has a height of 4.7 cm, but its original dimensions cannot be estimated (*Fig. 92*). It is a compact, gritty mass of brownish-yellow clay with a grey-black core, the preserved side of which has a curved, roughly polished surface, where the seal impression is found; the opposite side is broken off and sizeable inclusions can be seen inside the clay mass. Because the piece was retrieved from debris exposed to natural elements, one cannot be sure whether black patches on its surface are evidence of burning or if they are simply biological residues. The seal impression is quite worn, but it is doubtful how visible it would have originally been on clay as impure as this. We may note that the impression shows the seal was pierced and the imprint of a reed can be seen protruding from both sides of what was probably a suspension hole.

As far as the fabric of this object and, consequently, its provenance are concerned, the question as to whether it is locally made or imported cannot be answered at present. According to the expert opinion of J. Hilditch the object cannot be classified under local products with absolute certainty; on the other hand, the same uncertainty applies to the question whether or not it could be Cretan. A possible answer could be that we are looking at a fabric from a locality or a time period with which researchers are not familiar.[759]

Another question is what exactly this object was. One possibility is that it was a jar stopper; a second possibility is that it could have been a spherical loomweight, a so-called melon.[760] Both categories of objects are known — from findspots other than Akrotiri — to have carried seal impressions, so the fact that it is impressed is not really helpful.

The first possibility, that of the fragment belonging to a jar stopper, is problematic because we have no comparable parallels, even unstamped ones, from the site. Jar stoppers at Akrotiri are usually of stone, even pumice, or various other readily available items, such

756 See relevant and stimulating discussion in Relaki 2012; Krzyszkowska 2016.

757 Poursat 2001, 28.

758 Sofianou – Brogan 2010, 134, fig. 5.

759 Pers. comm., after examining the object in September 2009, for which I am grateful. In her own words: 'There are examples of local Theran sherds tempered with large flat phyllites and schists — the dilemma is whether this is Cretan (generally non-mica clay with large phyllite and schist inclusions) or local volcanic with "Cretan-type" temper.'

760 Burke 2010a, 433. It was registered as such in the excavation inventory book.

Fig. 92. Clay object **I3**, probably a spherical loomweight; scale 2:3 (Akrotiri Excavations Archives/*CMS* Archive).

as other vessels etc.[761] In one instance the mouth of an amphora was corked with a pebble and further sealed with apparently unfired clay.[762] Some lids appear to have been made of properly fired clay together with the pot and especially for it, as suggested by the matching dimensions and decoration;[763] some were also made of stone, to be used specifically as lids.[764]

Stamped jar stoppers are, however, known from Crete. Most date to the Protopalatial period, when direct sealings were the prevalent sealing type in Crete, and belong to a tradition going back as early as the EB II period.[765] The Protopalatial specimens seem, however, to function more as sealing supplements to jar lids of materials other than clay, i. e. clay was affixed around a jar opening with its lid on, and then stamped. There are a very few instances in the Neopalatial period when the stamped clay lump virtually replaces the lid of a jar, as a specimen with multiple impressions of the same lentoid from Chania shows.[766] Stamped stoppers of this kind are more commonly found in Mycenaean contexts.[767] The lack of satisfactory parallels, since the ones in question show repeated impressions of the same seal, considerably weakens the suggestion that **I3** could have been a jar stopper.

By contrast, the second suggestion, that of the spherical loomweight, appears more plausible. Until recently, among hundreds of loomweights retrieved at Akrotiri, not one was of the spherical type. Spherical loomweights are considered in any case to have been

761 *Thera* IV, 40, pl. 98a: a flat pumice chunk found as a lid on a vessel from Room D2; *Thera* IV, 40, pl. 98b: flat stone discs, suggested to have been used as vase lids; *Thera* VI, 32, pls. 9, 71, 72: stone pebbles, circular schist slabs, small vessels, a broken jar handle, all used as lids; Moundrea-Agrafioti 2007, 102–12 nos. 9, 27, 28, 56: stone pebbles; Devetzi 2007, 153–54 nos. 51–55: flat stone slabs, used either as lids or as bases for large pots.

762 Moundrea-Agrafioti 2007, 104 no. 9, figs. 13, 15.

763 *Thera* VI, pls. 74c, 78a.

764 Devetzi 2007, 116 nos. 10, 11: stone lids.

765 *CMS* II,8 pp. 369–72, with reference to numerous Protopalatial examples. The terminology in German for these primarily Protopalatial specimens is *Gefäßrandplomben*. A typical EH example is shown on the backs of the sealings from Geraki in Lakonia (*CMS* V Suppl. 3 pp. 43–47).

766 *CMS* V Suppl. 1A no. 138.

767 *CMS* II,6 pp. 372–74, for two LM III stamped jar stoppers (*Stopperversiegelung*); II,6 nos. 173, 174, 210 (Malia); II,8 no. 716 (Knossos); V Suppl. 1A nos. 147–149 (Chania); Krzyszkowska 2005a, 287–89.

exclusively Cretan, in that they were never found outside Crete and, more specifically, never outside central and eastern Crete.[768] The recent excavations at Akrotiri for the foundation of the new pillar pits have yielded a number of spherical loomweights,[769] a fact which ought to alter the perception we have of this type of loomweight.

Great quantities of spherical loomweights are found primarily in connection with Neopalatial contexts in Crete, but they do already appear in the Protopalatial period, as Malia abundantly testifies.[770] Since very few Protopalatial settlements are known and investigated in Crete, it is possible that the large number of Neopalatial spherical loomweights can be explained by archaeological chance. Malia has yielded a large number of spherical loomweights, including stamped examples in Quartier Mu[771] and buildings to the NE border of the palace.[772] They all share a common characteristic, in that they are stamped by flat, round seals made of soft stone, such as the one that was used to stamp **I3**.

Apart from stamping, incised signs can also be observed on spherical loomweights, both Protopalatial and Neopalatial in date. Malia again provides nine incised spherical loomweights of Protopalatial date.[773] Incised single marks are also present on Neopalatial specimens,[774] and there is one instance where the single sign is in fact impressed multiple times into the clay.[775]

Other varieties of loomweights found on Crete were also stamped and in most cases the seals used had a flat round seal face. Examples include quadrangular loomweights from Chamaizi,[776] Kato Zakros,[777] the Quartier Mu in Malia[778] and Palaikastro;[779] pyramidal loomweights from Kato Zakros,[780] the Quartier Theta in Malia[781] and Palaikastro;[782] and cylindrical loomweights from Malia Quartier Mu.[783] On some examples the seals seem to have been impressed with some force, leaving an impression some millimetres below the surface of the loomweight, as is the case for **I3**.

768 Burke 2010b, 51–55; Cutler 2012, 153–54.

769 A number of spherical loomweights, some of which are intact, are recorded in the excavation inventory book and have been examined by the author. They all derive from the excavations for the foundation of the NPPs, see Tzachili forthcoming.

770 Yet there could have been a selective distribution of spherical loomweights in the Protopalatial period: out of 428 loomweights from Petras in Siteia recorded between 1985 and 1996, none is of the spherical type (Burke 2006, 283).

771 *CMS* II,6 nos. 203, 207; Detournay *et al.* 1980, 204–06 nos. 292 and 296.

772 *CMS* II,6 no. 213 (apparently the same seal face as II,6 no. 203, see previous note); II,6 nos. 217, 218.

773 Poursat in Poursat *et al.* 1978, 100–04; Poursat 1996, 176. Incisions are also observed on loomweights of other shapes (Poursat 2001, 28–29; 2013, 93).

774 Evely 1984, 247, pl. 231.5, where five spherical loomweights 'of various shapes and sizes' out of 'over 150' from the Unexplored Mansion bore an incised cross.

775 Burke 2003, 197, fig. 8.1.11, where on the heaviest of the 11 spherical loomweights from the Knossos South House three cross-shaped marks are present, executed through impression rather than incision.

776 Of MM IA date: *CMS* II,6 no. 153.

777 *CMS* II,6 nos. 165, 167.

778 *CMS* II,6 no. 190; Detournay *et al.* 1980, 204–06 no. 295; Poursat 2013, 94.

779 *CMS* II,6 nos. 236–238, 240, 241, 243, 244, 247.

780 *CMS* II,6 no. 166.

781 *CMS* II,6 no. 175 (impression of a flat, round seal face, stylistically very close to the 'Malia Workshop' group of seals).

782 *CMS* II,6 no. 242.

783 *CMS* II,6 no. 192; Detournay *et al.* 1980, 204–06 no. 293; Poursat 2013, 94.

I1

Fig. 93. Impression on discoid loomweight **I1** (Akrotiri Excavations Archives/*CMS* Archive).

The evidence outlined above leads to the conslusion that **I3** is best classed as a loomweight. The on-going study of loomweights from Akrotiri should be able to corroborate or reject this suggestion in the future.

THE ICONOGRAPHY: THREE UNIQUE MOTIFS

As expected, the impressions on the three objects under discussion were made by seals otherwise unattested at Akrotiri and in the Aegean in general; nevertheless their motifs do find parallels among Cretan material.

Quatrefoil

The fragmentary discoid loomweight **I1** bears a seal impression that measures 2.7 × 2.53 cm, and is preserved almost intact (*Fig. 93*). The size of the impression, and consequently of the seal that produced it, is exceptionally large and unusual by Aegean standards. The shape of the flat seal face itself, which is roughly quadratic, is otherwise unattested. Most Aegean quadratic seal faces have either straight or slightly outwards curved sides; this particular seal had its sides slightly curved inwards.

The motif is that of a simple quatrefoil with four stylized lancet leaves in between. The motif is not perfectly symmetrical. The surface of the flower 'petals' was smooth and relatively even, and the petals have grooved borders. The grooved borders appear as a trait of numerous quatrefoil motifs executed on Minoan soft stone seals, namely made of steatite,[784] but also of some made of bone.[785]

The motif is mostly attested on EM III–MM IA seals found in central and eastern Crete, but is also present among MM II soft stone seals, some of which are made of chlorite.[786] It also appears many times among the seal impressions from the Phaistos sealings depos-

784 Some examples: *CMS* III no. 208b; VI no. 29c; IX no. 26c.

785 For instance: *CMS* IV no. 120; V Suppl. 1A no. 251.

786 Anastasiadou 2011, 260, pl. 79; for instance, *CMS* II,1 no. 92a; VI nos. 53a, 84b; VII no. 29c; XII nos. 42a, 104b.

it.[787] The closest parallels for the motif occur where a quatrefoil inside a slightly incurving quadratic border is circumscribed by a circular seal face.[788] As far as the size of the original seal is concerned, however, no exact matches can be found. Its dimensions are too large for the usual EM III–MM II seals, which reach a maximum of 1.5 cm, with seals over 2 cm being an exception. Comparable sizes can be found among earlier seals (EH II), all made of steatite.[789]

The lengthy timeframe (EH II–MM II) during which seals with similar features were made and their distribution both on the mainland and in Crete makes it impossible to pinpoint the date or origin of the original seal used on **I1**. In any case, the seal had in all probability been manufactured earlier than the time the loomweight was stamped.

Scorpion

All the (at least) 13 impressions on the pithos rim **I2** were made by the same convex and slightly asymmetrical oval-faced seal of 1.1 cm in length and 1 cm in width (*Fig. 94*).[790] The seal face displays a scorpion seen from above and rendered symmetrically: five bent legs emanate from both sides of a central vertical line, which stands for the animal's body; pincers protrude from the front part, again on both sides, whereas the back part of the body ends in a curled tail. The motif takes up the entire seal face.

The scorpion motif occurs on both Prepalatial Cretan seals,[791] and on examples of Protopalatial date.[792] It was subsequently passed on to the Neopalatial 'talismanic' tradition,[793] as were many of the soft stone Protopalatial decorative motifs. The scorpion motif is also attested on impressions from the Knossos Eastern Temple Repository[794] and from Zakros House A.[795] The morphological traits of the Theran impression neither resemble the Prepalatial representations of scorpions, where the body is always oval-shaped, nor typical 'talismanic' examples, where the body comprises adjoining semi-circles. However, it does seem to borrow an element found on scorpions on a few soft stone seals, presumably of late Prepalatial and Protopalatial date: the abstraction in depicting the animal's body, indicated by a simple straight line.[796] In addition, the fact that a real scorpion has four pairs of legs, instead of the five shown here, betrays the craftsman's intention to cover all available space on the seal face, rather than to depict the animal in an anatomically realistic manner.

The craftsmanship of this particular seal was extremely fine and most probably denotes a hard stone seal. The convex seal face points to a manufacture date from the MBA onwards, when seal faces became convex in order to facilitate engraving.[797]

787 *CMS* II,5 nos. 213–222.
788 *CMS* II,1 no. 102 (Agia Triada); II,8 no. 1 (Knossos); V Suppl. 1A no. 251 (Moni Odigitria).
789 *CMS* V no. 526a (Asine, Argolid); V Suppl. 3 no. 208a (Krannon, Larissa); XI no. 139 (Kolonna, Aegina).
790 The discussion about this impression is based mostly on Karnava – Nikolakopoulou 2005 (section written by the present author), augmented and updated.
791 *CMS* II,1 nos. 223, 225, 248, 250, 307 (Marathokephalo, Platanos).
792 *CMS* II,2 nos. 153, 182, 240 (Malia).
793 Onassoglou 1985, 82–85 (*Das »Skorpion«-Motiv*). See also *CMS* I Suppl. nos. 85, 86; II,3 no. 308.
794 *CMS* II,8 no. 153.
795 *CMS* II,7 no. 108.
796 *CMS* II,1 no. 307b (*stilisierter Skorpion*); II,2 nos. 240b, 292b.
797 Krzyszkowska 2005a, 85.

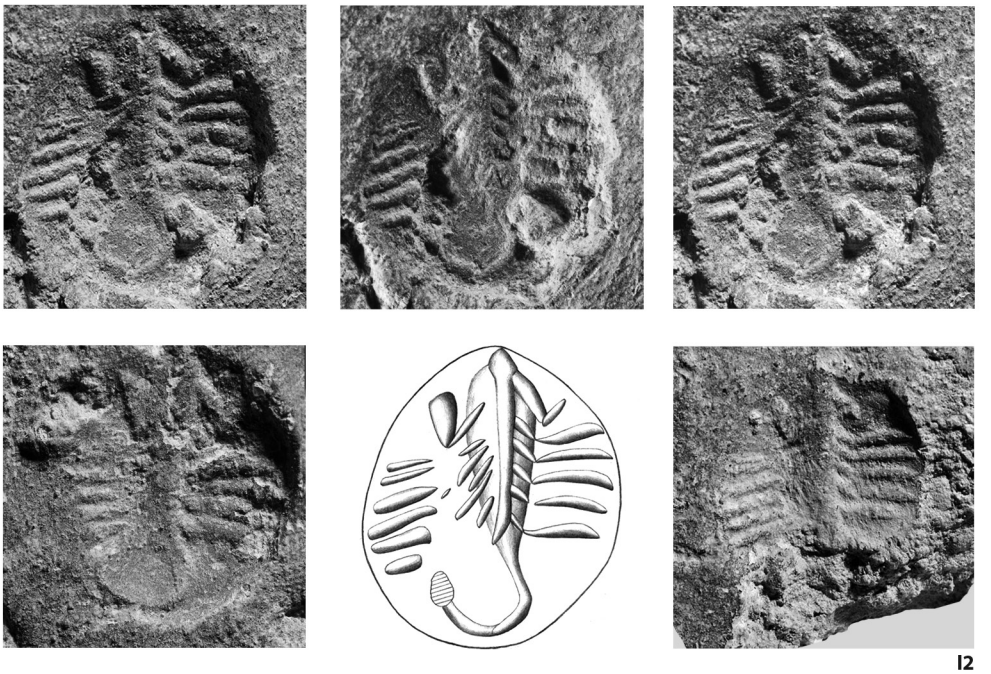


Fig. 94. Multiple impressions of the same seal on pithos rim **I2** (Akrotiri Excavations Archives/*CMS* Archive).

Whirl

The impression attested on the fragmentary object **I3** originated from a flat, circular-faced seal (Ø 1.5 cm) (*Fig. 95*). It is quite worn and the motif is almost effaced. The seal had a simple whirling motif that covered its entire surface; the central part is too worn to say if the motif had a central boring/disc, as attested on numerous seals with a whirl motif. No supplementary decoration can be discerned.

The whirl is quite stylized and its six tentacles end in scrolls. The motif, or variations of it, is first encountered among EM III–MM IA seals made of hippopotamus ivory from tholos tombs in central Crete.[798] Later, in the Protopalatial period, numerous examples of whirl motifs come from the Malia Workshop and are mostly found on three-sided steatite prisms.[799] A near parallel for the present motif occurs on a seal in the Metropolitan Museum, New York,[800] which has a seal face with a diameter of 1.3 cm, a round flat face and a rather superficially engraved motif. This specific seal is attributed to the Malia/Eastern Crete Steatite Prisms Group, examples of which are found in sites in east-central and eastern Crete during the Protopalatial period.[801]

798 *CMS* II,1 no. 3 (Drakones); IV no. 41 (Kaloi Limenes); V Suppl. 1A no. 268 (Moni Odigitria).

799 Anastasiadou 2011, 285–86, pls. 100, 101, motif 255: Whirl. More specifically, they are listed under the Malia/Eastern Crete Steatite Prisms group.

800 *CMS* XII no. 51b; Anastasiadou 2011, 286, pl. 101, motif 257: Whirl Spiral.

801 Anastasiadou 2011, 113, fig. 55; 2016, 160–63.

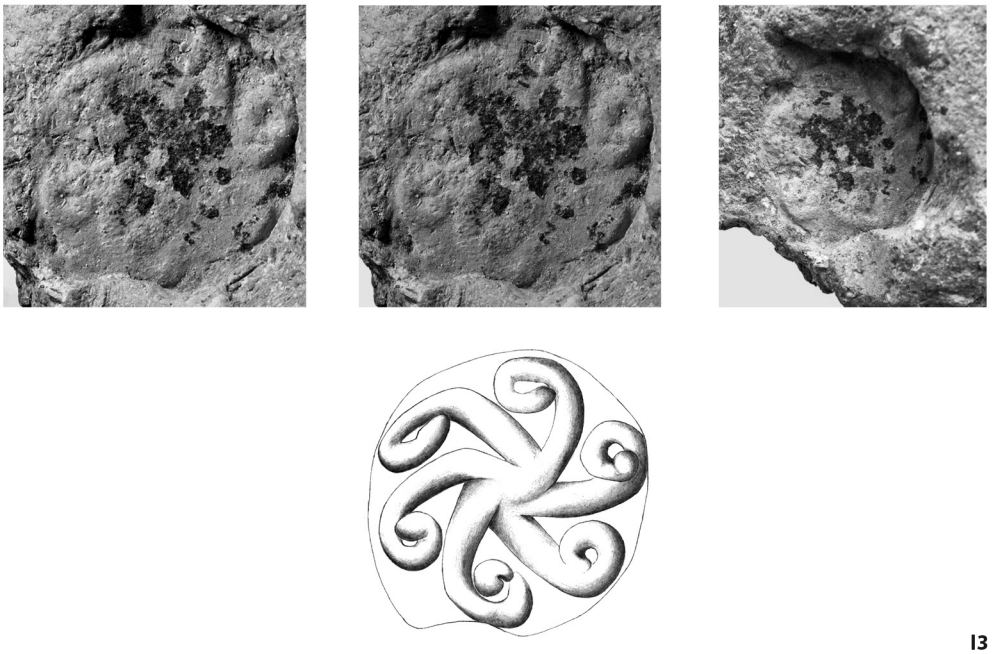


Fig. 95. Impression on the probable spherical loomweight **I3** (Akrotiri Excavations Archives/*CMS* Archive).

The whirl motif therefore proves popular during the late Prepalatial as well as the Protopalatial period. On iconographical and stylistic grounds, however, the closest parallels for the Akrotiri impression are those found among EM III–MM IA seals of hippopotamus ivory. Tentacle arms that end in scrolls are most characteristic of seals of the Parading Lions Group, which dates to EM III–MM IA and is popular in south-central and central Crete.[802] It is, therefore, possible that the Akrotiri impression came from a seal of this type. Whether the seal had actually travelled to Akrotiri depends on whether object **I3** is a local Theran or an imported product; for now this cannot be determined.

DISCUSSION: RANDOM STAMPING AT AKROTIRI

The Small Number of Impressed Objects

The way things stand and on the basis of the material that has been presented so far in this study, we have no secure evidence of actual seal use at the site of Akrotiri apart from the stamped pithos rim **I2** of local manufacture (*Figs. 90–91, 94*). For the time being, the other two objects with seal impressions defy classification under local or imported production. Therefore the question posed in Chapter 1 regarding the existence of seals, in their majority imported at Akrotiri, now recurs in connection with these few stamped objects. What

802 Yule 1981, 208–09; Sbonias 1995, 89–99. The seal group has recently been the focus of analysis on the social identity and interaction between seal users (Anderson 2013; 2016, *passim*).

was the role of seals at Akrotiri? The case for administrative functions is weak. So far we have had evidence for the presence of individuals who were literate in Linear A, as demonstrated by the locally-made Linear A tablets, the locally produced as well as imported inscribed pots and a graffito on a pot sherd.[803] This evidence points to a purely administrative use of the writing system on Thera. While this purpose is also attested in the script's original home in Crete, there it is supplemented by additional functions in the religious and mortuary spheres not currently attested in Thera. Assuming that the pithos rim was stamped and inscribed by one and the same person, whether potter or scribe, this is the closest we come for now to the possible existence of a seal bearer/administrator at Akrotiri. But as previously discussed, the particular way in which the seal was used does not really offer solid grounds for its administrative use. At present, therefore, we cannot confirm that seals were actually used at Akrotiri, or if they were used in a fashion comparable to Neopalatial Crete.

The stamped loomweights could make a more compelling case for some kind of organized administration, were they to be proven local. It has been suggested that textile production for trade purposes must have been among the many important economic activities in LC Akrotiri. This view is supported by the hundreds of loomweights found in different buildings of the town, and also by the entries on the Linear A tablets which indicate considerable quantities of textiles.[804] Production of textiles on an industrial scale would certainly have required some sort of control and organization, in which the stamping of loomweights may have played a part.

The Findspots of Stamped Objects

The only findspot of a stamped object at Akrotiri that is worth discussing is that of the discoid loomweight **I1**, which was found inside a room in Delta-North (*Figs. 81–83*). The other two stamped objects were both discards in open-air spaces. Delta-North, seemingly a separate building unit from the other three that constitute Complex Delta (Δ),[805] does not stand out from the rest of the typical urban houses at Akrotiri.[806] One of its lower floor storerooms, the basement Room D3, contained a hoard of bronze vessels,[807] while the upper-storey Room D17 was probably decorated with wall paintings.[808] Whether this

803 Michailidou 1992–93; Karnava 2007–08; Boulotis 2008. The inscribed pithos from the House of the Ladies is a Cretan import (Boulotis 2008, 69; on the inscription, see now Karnava 2016b, 350–52) and the infamous *a–re–sa–na* jug THE Zb 2 is also probably imported (Nikolakopoulou, pers. comm.; *Figs. 82–83*). In this respect, the suggestion that an inscribed pithos from the Knossos Temple Repositories belonged in all probability to a batch of imported pithoi from the Cyclades constitutes a most interesting development (Christakis 2010).

804 Tzachili 1990; Boulotis 2008; Karnava 2008, 383–84.

805 Palyvou 2005, 80–83. The distinction between building units through double walls can only be seen on the ground-floor level; the upper level(s) of the building units were probably restructured after the SDL and are not strictly divided. See also Chapter 1, p. 25, for the definition of 'building units'.

806 Palyvou 2005, 45–46, for the 'Theran house model' as opposed to the Xeste buildings that do not entirely conform to it.

807 *Thera* IV, 17–18, 39.

808 Doumas 1992, 188, pl. 151; Michailidou 2001, 308. The only other room in the whole of Complex Delta (Δ) to have wall paintings was the ground-level Room D2 with the Spring Fresco (Doumas 1992, 99–107).

'specialization' in the storage of bronze vessels points to a special significance of the whole building unit is far from certain.[809]

As far as discoid loomweights at LC Akrotiri are concerned, they appear not to have been present in every building of the settlement, nor in every room of the buildings in which they were found.[810] Almost half of the nearly 1000 discoid loomweights retrieved from the VDL layer at Akrotiri were found in the West House.[811] Some 200 were retrieved from Sector Alpha (A),[812] Building Beta (B) produced about 50 loomweights,[813] while the remaining specimens, some 300, are presumably from Complex Delta (Δ). Although it has been stated that in all of Complex Delta (Δ), only Delta-North produced discoid loomweights,[814] in fact numerous loomweights were also found in Room D1, which belongs to the building unit Delta-West,[815] as well as Room D13, which is part of Delta-South. The latter was described by the excavator as 'packed with loomweights'.[816] According to the numbers extracted from these preliminary reports and although no particular mention is made in Marinatos' accounts of loomweights in Room D4–D5,[817] it seems that from the whole of Delta-North only these two spaces produced '10-50 loomweights',[818] a number that would have been sufficient for the operation of a maximum of two warp-weighted looms.[819] Whether the loomweights found in Room D4–D5 were in use or in storage is not clear. In addition, the fragmentary state of **I1** does not allow us to judge whether the object had been broken and thus discarded or whether it broke because of the devastating events that occurred. In any case, the stamped loomweight **I1** was in an environment where weaving was with all probability actively practised, whether at the time of the volcanic destruction or prior to it.

The Stamped Loomweights

In the absence of petrological examination, the question currently remains open as to whether the discoid loomweight **I1** and the probable spherical loomweight **I3** were locally-made or imported. The idea that loomweights travelled is not unheard of in the prehistoric Aegean; they were exchanged, traded or accompanied specialized craftsmen. Some discoid loomweights found at Agia Irini on Kea, Miletus, and Nichoria in the Peloponnese are

809 Other concentrations of bronze vessels were found stored together with other kinds of vessels or objects, all on ground-floor rooms of Complex Delta (Δ) (Polychronakou-Sgouritsa 2000, 80–81). None of the other instances constitute, however, a typical storeroom, since Room D16 was probably a storeroom for objects to be traded (see further Chapter 1, pp. 33–38), whereas Room D18a was in all probability an 'emergency' storeroom, i.e. a context disturbed by the activities of the 'squatters' (see further Chapter 2, p. 144).

810 Tzachili 1990, 381, 385; 1997, 184, fig. 92. The numbers are based on whole items retrieved from building interiors and do not include broken or discarded specimens (Tzachili 1997, 184, n. 21).

811 Tzachili 2007a, 262–71.

812 *Thera* II, pl. 39.

813 Tzachili 1997, 185, fig. 92. The loomweights from Building Beta (B) are erroneously reported in p. 184 of that work as being 'in the area of 100'.

814 Tzachili 1997, 185, fig. 92; 2007b, 191, where it is specified that, as far as Complex Delta (Δ) is concerned, loomweights are limited to Delta-North, while they are ubiquitous in Building Beta (B).

815 *Thera* IV, 19, pl. 27a, where loomweights can be seen in a heap on what was probably a window sill.

816 *Thera* IV, 27, pl. 50a, where at least 50 can be counted in the photograph.

817 *Thera* IV, 13–14, where the excavation of these rooms is described.

818 Tzachili 1997, 185, fig. 92.

819 Barber 1991, 104.

thought to have been manufactured elsewhere and imported ready-made to these sites. The fabrics of these imported specimens are similar to those attested on Crete, leading to the suggestion that weaving equipment was transported by itinerant craftsmen, who carried the 'tools' of their trade.[820] In an interesting turn of events, LC discoid loomweights from Building Beta (B) and Complex Delta (Δ) appear to have been imports from Miletus, a suggestion put forward on account of their fabrics.[821]

The two loomweights under discussion here are interesting for different reasons. The discoid loomweight is no novelty at Akrotiri, but the spherical loomweight is. Very few discoid loomweights are known to have been stamped in Minoan Crete, but spherical ones offer a larger sample for consideration. In any case, it is certain that the practice of stamping loomweights originated in Crete; whether this represents another Minoan practice adopted at Akrotiri depends on whether the loomweights were themselves imported.

The seal impressions on both loomweights are again interesting for different reasons. The large seal that was used to stamp the discoid loomweight **I1** cannot be assigned a specific date based on its size (*Fig. 93*). Its quatrefoil motif can easily be placed within the decorative tradition of Minoan glyptic from EM III onwards, originating in the Mesara region and spreading towards north-central and eastern Crete, but its size remains a *unicum* pointing to even earlier dates. By contrast, the round, flat seal face used to stamp the probable spherical loomweight **I3** has numerous parallels among seal impressions on MM spherical loomweights, which conform in shape and size with it (*Fig. 95*). The motif, a whirling spiral, places the seal among late Prepalatial and Protopalatial seal production in central and eastern Crete. To date there is no evidence for the stamping of spherical loomweights after the Protopalatial period; thus the retrieval of the Akrotiri specimen from LC I layers is somewhat problematic. However a note of caution is justified, since many Neopalatial spherical loomweights have not yet been studied.[822]

The seal impressions on loomweights have hitherto been interpreted as indications of ownership.[823] A particularly bold suggestion by Weingarten concerns the use of cuboid LM I loomweights as tags that accompanied products, they therefore either indicated ownership, content or destination of the travelling products.[824] Whether such a suggestion can be expanded to fit other shapes of loomweights is not clear; the observation that cuboid loomweights follow the stamping patterns attested on other shapes of loomweights weakens the case for a potentially separate role for this shape.[825]

Multiple Seal Impressions on an Inscribed Pithos Rim

The inscribed pithos rim **I2**, with its (at least) 13 impressions, is unique by the standards of the prehistoric Aegean (*Figs. 90–91*): no parallels exist for seal impressions on inscribed pots and hence their purpose, if any, eludes us. As briefly discussed above, seal impressions on clay vessels are either seen as attempts at decoration or considered as some kind of

820 Barber 1991, 299–310; Cutler 2012, 149–50.
821 Knappett – Hilditch 2015b, 204.
822 Burke 2010b, 51–55.
823 Burke 2010b, 43–44.
824 Weingarten 2000.
825 Burke 2010b, 59.

administrative control. The question of personal ownership is currently unfounded, since there is no way of proving such a situation. The few parallels however — which all involve vessels that were stamped, but not inscribed at the same time — point to a Cretan origin for this practice, specifically during the Protopalatial period. By contrast, evidence for incised clay vessels derives from both the Protopalatial and the Neopalatial periods.[826]

The sequence of incising the inscription on the pithos rim and then proceeding to stamping prompts us to regard the stamping as some sort of authentication, control or even a mnemonic device relating to the content of the inscription or an action that was registered by the inscription (which, in this case, is suggested to have been the recording of wine). Against the idea that the seal impressions stood for something meaningful are their multiple, careless and random positions: if authentication or control had been intended, a single seal impression would have sufficed, especially on parts of the rim where they would have actually been visible. There is, however, a further suspicion created by the near agreement of the number of seal impressions, which are (at least) 13, and the horizontal strokes that stand for numerical entries on the vertical rim of the pithos, which are (at least) 12. These strokes are quite superficial and squeezed in between signs, as if they had been added at a later stage. Much like the seal impressions, some of which had been made when the clay was nearly dry, so too do the numerical entries gradually become more and more superficial from the bottom of the inscription to the top. This suggests that they could have been added one by one, corresponding with the seal impressions. In this case, the seal impressions could have functioned more as a reminder of the quantity '10', for which each stroke would have stood, rather than a sign of authentication.

826 For vessels inscribed in Cretan Hieroglyphic: *CHIC* pp. 293–318; for those inscribed in Linear A: *GORILA* IV pp. 63–115.

CHAPTER 4: SOME ASPECTS OF MINOAN NEOPALATIAL ADMINISTRATION

The publication of primary archaeological material is not meant to discuss in detail or attempt to solve all matters that arise from its discovery. The Akrotiri sealings, however, which represent the most recent assemblage of Minoan Neopalatial administrative sealings uncovered, have provided new insights into the Minoan administrative system and revealed certain hitherto undetected aspects of it. In addition, the present study has made use of high-quality and uniformly presented comparative material, made available through the printed *CMS* volumes and the latter's updated online version. For these reasons this chapter aims to contribute to a broader discussion of Neopalatial administration in light of the new evidence. It does not pretend to solve all research problems and questions that arise from studying the material. But it presents an evaluation of the new finds; an attempt to integrate them with existing evidence; and a discussion of how they shed new light on Neopalatial administration.

HISTORY OF RESEARCH

Nodules from Neopalatial Cretan Sites

The first clay administrative sealings to be discovered in Crete were found in the palace of Knossos during the very first excavation season in 1900. Soon afterwards in 1901 the site of Zakros at the eastern tip of the island yielded an important sealing deposit. Agia Triada followed suit with a large number of sealings retrieved in 1902–03, and so did Gournia in 1901 and 1903–04 albeit with a significantly smaller number. Thus in the first decade of the 20th century a new category of archaeological finds had materialized in the Aegean. Since these humble and often poorly-preserved clay nodules bore seal impressions, they provided a rich source of evidence for iconography, which soon became the prime focus of their study. In 1922 the palace of Malia joined the findspots of administrative documents and Sklavokambos was put on the map through its investigation in the early 1930s. The excavation of the Zakros palace in the 1960s added more sealings to the Cretan map. The evidence from Chania came to light in 1973 and 1974, while the finds from Akrotiri from the mid-1990s are among the most recently discovered. The site of Gournia, which is currently being investigated once again, has produced the newest finds to date.[827]

knossos

Substantial numbers of seals and sealings are attested in the palace of Knossos and its surrounding area. Evans was the first to identify, document and discuss the clay nodules from

827 For a map of the findspots of the main Linear A documents and sealings, see Hallager 1996, 26, fig. 3; Thera was still unaccounted for at the time since it had only produced pottery inscriptions.

the palace in the early 20th century (*Fig. 96*).[828] But as with all Knossian objects, the dating and precise findspots of many sealings are debatable; some order has now been established thanks to the inclusion of all the available material in the *CMS*.[829]

It has been suggested that the flat-based nodules from the 'Hieroglyphic Deposit' are the earliest examples of this sealing type.[830] But since the date of this deposit is not certain,[831] we cannot be sure precisely when the flat-based nodule was invented and introduced in Minoan administration. The co-existence in the same deposit of a flat-based nodule impressed with a Hieroglyphic seal that also impressed a crescent-shaped nodule, i.e. a document clearly belonging to the Protopalatial Hieroglyphic administration, underscores the problems connected to the dating of the 'Hieroglyphic Deposit'.[832]

The most interesting deposit from the Knossos palace for the purposes of this study is, however, the mass of luxury objects, Linear A documents and sealings retrieved in the Eastern Temple Repository. Until recently, the *terminus ante quem* posited for the discard of this deposit has been the transition from MM III to the LM I period,[833] but the latest estimate suggests a firm LM I date.[834] It is in any case the most immediate predecessor to the Akrotiri sealings in terms of dating, as the sealing types and their iconography demonstrate. The sealings recovered amount to about 95, among which are 30 flat-based nodules, 45 *noduli*, six roundels, some 12 hanging nodules and one or two direct sealings.[835]

ZAKROS

In 1901 Hogarth uncovered a deposit containing numerous impressed clay nodules inside a building in the town of Kato Zakros, which he called House A.[836] The excavator counted some 500 nodules, while their most recent count enumerates 555 specimens. Among 548 identifiable nodules there are: one roundel, five *noduli*, six single-hole hanging nodules, 50 two-hole hanging nodules and 486 flat-based nodules.[837]

Hogarth interpreted his finds from the very beginning as '… seals attached to documents', but was at first hesitant as to whether their preservation was due to intentional

828 The discovery of the 'Hieroglyphic Deposit', which contained incised and stamped clay documents, was the very first instance (Evans 1899–1900, 55–63; 1909; Evans 1921a, 271–85).

829 *CMS* II,8 pp. 101–28, where the findspots of the sealings are catalogued by Gill.

830 Müller, in *CMS* II,6 p. 349. Some 'proto'-flat-based nodules are thought also to have been present in the Phaistos sealing deposit (Hallager 1996, 135), but their appearance is not convincing (for the types of direct sealings attested at Phaistos, see also Krzyszkowska 2005a, 104–08).

831 A discussion on the dating problems in Schoep 2001, with lengthy previous bibliography; now see *CMS* II,8 pp. 6–8.

832 Krzyszkowska 2005a, 115. The impression is *CMS* II,8 no. 79, attested on HMs 185 (crescent) and 195 (flat-based nodule), and comes from a hard stone Hieroglyphic prism. However, it is noteworthy that the unique flat-based nodule from the Malia palace deposit, which dates to the later part of MM III, also bears an impression from a hard stone Hieroglyphic prism, see below pp. 182–83.

833 Pini 1990.

834 *CMS* II,8 p. 8.

835 Krzyszkowska 2005a, 165.

836 Hogarth 1900–01.

837 In *CMS* II,7 (1998) 559 specimens are included, both from the palace and House A. The latest count comes from the on-going study of the Zakros material by M. Anastasiadou and includes 560 sealings (pers. comm.). Five among these 560 sealings are counted as originating from the palace, but see Chapter 2, n. 474, for a possible confusion in the provenance of one sealing.

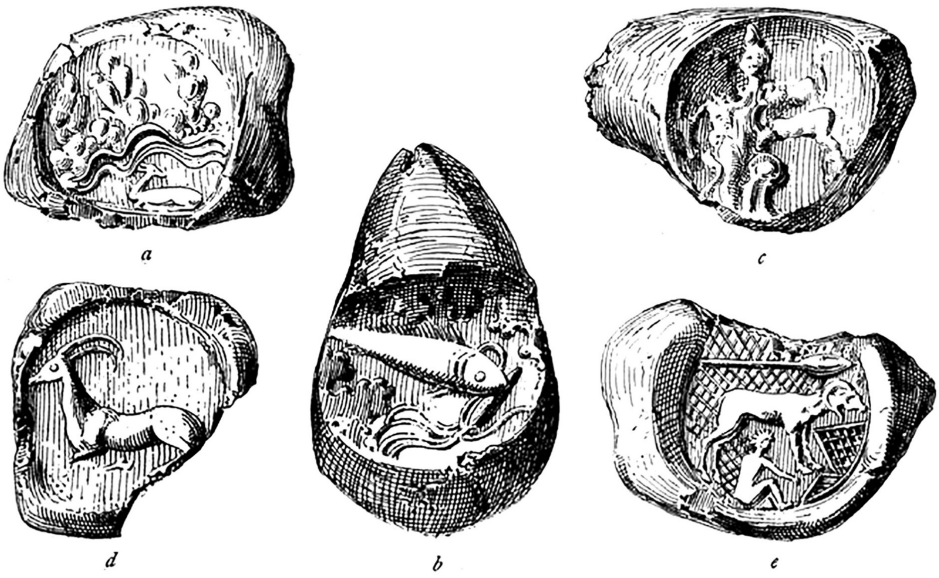


Fig. 96. Sealings from the Knossos 'Hieroglyphic Deposit': two flat-based nodules (with impressions of: a = *CMS* II,8 no. 376; d = II,8 no. 375); one one-hole hanging nodule (b, with impression of *CMS* II,8 no. 157); one two-hole hanging nodule (c, with impression of *CMS* II,8 no 286); one *nodulus* (e, with impression of *CMS* II,8 no. 33) (Evans 1921a, 273, fig. 202).

Fig. 97. Seal impressions with 'monstrous' iconography from Zakros House A (from left: *CMS* II,7 nos. 127, 124, 134) (Hogarth 1902, 79, figs. 8–10).

or unintentional firing.[838] He presented his material in a detailed article,[839] concentrating mainly on identifying the motifs of the impressions, which he put at 144. He first commented on the predominantly 'monstrous' iconography of the impressions, which he considered was of local derivation (*Fig. 97*). He noted that the nodules were of fine clay and observed the imprint of something cylindrical on the back, 'to which the nodule was pressed while still wet'. Excluding textile, he suggested reed or papyrus stalk, i.e. materials that are organic and thus combustible: he apparently failed to recognize this contradicted his statement that the nodules had been intentionally baked. The Zakros sealings were the

838 Hogarth 1900–01, 133.
839 Hogarth 1902.

object of extensive studies even in the 1920s. While studying the Agia Triada sealings, Levi made separate observations on the Zakros material and, still preoccupied with iconography, he identified a further 56 motifs.[840] The most recent count of the individual seals used to stamp these 555 nodules is 256.[841]

Hogarth also described the context in which these nodules were found.[842] They were located as a single deposit in Room VII of the building, together with a number of bronze implements (a knife, two mattocks, four round points), a steatite lamp/altar, and two clay strainers. At the time, the only other nodule types besides the flat-based ones were described as a clay 'wedge' and a roundel. The excavator noted that the sealings were retrieved 'over a restricted and roughly circular area [which] suggests that they had fallen all together from a height on the collapse of some receptacle in which they had been stored'. The circumstances in which the sealings and associated finds were recovered — 'at a height of 1ft. 6 inches from the floor', over 'carbonised matter mixed with potsherds and bits of painted plaster', and 'under a mass of disordered bricks of the largest type (24 inches × 16 × 4)' — made the excavator uncertain as to whether the nodules belonged to the ground or first storey. He suggested that they had been stored 'either among the rafters of the lower terrace, under a painted ceiling, or below the floor of the upper terrace, perhaps in a sunken receptacle made of bricks, like the stone κασέλλες let into the floors of Knossian galleries'. The room immediately to the NW of Room VII, Room VIII, was possibly a storeroom of food-stuffs, since five pithoi, nine amphorae, and 13 handless cups were retrieved there. The quality of finds in House A, namely fine pottery, a tablet and the sealings, prompted the excavator to think of the structure as 'the residence of the local chieftain, or governor'.

Further nodules were discovered at Kato Zakros when the palace was excavated by Platon in the 1960s. Several nodules were noted to have been found by the excavator but only five have been identified to date: two flat-based nodules, two *noduli*, and a two-hole hanging nodule.[843] The nodules were found in various findspots in the western wing of the palace where a number of Linear A tablets were also recovered.

AGIA TRIADA

An important site in the history of research into Minoan sealings is Agia Triada in the Mesara, where numerous sealings were retrieved in excavations carried out in 1902–03, but only published years later.[844] Especially notable at Agia Triada is the impressive number of single-hole hanging nodules, 936, the largest quantity in any Neopalatial deposit (*Fig. 98*); most examples bear an incised Linear A sign. In addition, the site has produced 11 two-hole hanging nodules, 22 roundels and 53 *noduli*.[845] Finally, there are 70 flat-based nodules, impressed by 62 different seals; while the number of the Zakros flat-based nodules is comparable to those found at Akrotiri, the latter were stamped by only 16 seals (see *Fig. 62*).

840 Levi 1925–26b.
841 *CMS* II,7.
842 Hogarth 1900–01, 129–34.
843 Platon 1971, 147, 151, 159; Platon – Brice 1975, 35. Again, see n. 474 for a possible mix-up of a sealing presumed to be from the palace.
844 Levi 1925–26a; *CMS* II,6 nos. 1–148.
845 The numbers are taken from Hallager 1996, 25, 41.

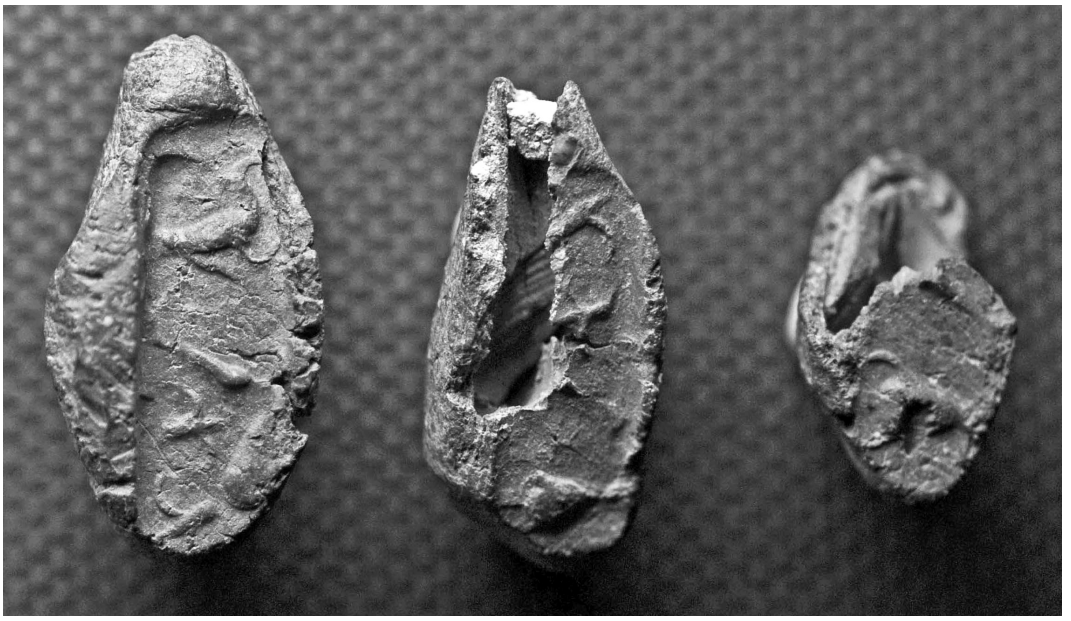


Fig. 98. Three single-hole hanging nodules from Agia Triada with the impression of the same seal; (HMs 556/1–3 = *CMS* II,6 no. 143; Archaeological Museum of Herakleion © Ministry of Culture and Sports/ Archaeological Receipts Fund, photos by A. Karnava).

The archaeological evidence regarding the findspots of stamped documents in Agia Triada is particularly problematic, because little archival evidence is available to clarify this matter. Nodules were found in the so-called Royal Villa and in another building, the *Casa del Lebete*, but their exact localization within these buildings has been a painstaking process.[846]

GOURNIA

From the investigations of Hawes at Gournia in 1901 and 1903–04 a number of stamped documents were collected,[847] including two flat-based nodules.[848] One bears the impression of a large gold ring with a bull-leaping scene,[849] while the second was impressed by a 'talismanic' seal[850] — a rarity, since only a few sealings stamped by 'talismanic' seals are known (*Fig. 99*).[851] A total of 16 sealings have been retrieved so far from the settlement and cemetery at Gournia: 13 *noduli*, two flat-based nodules, one roundel; these documents were

846 Militello 2002; 2012. The Agia Triada sealings are currently under study by B. Montecchi (University of Heidelberg).

847 *CMS* II,6 pp. 171–80.

848 Williams, in Hawes *et al.* 1908, 55, where a *nodulus* and a flat-based nodule bearing seal impressions of 'look-alike' seals are mistakenly taken to bear impressions from one and the same seal: p. 54, fig. 30-4: '… duplicate impressions, one of red, the other of black clay, that were found in the West Court of the palace …'. The mistake is already noted by Betts 1967, 16.

849 *CMS* II,6 no. 162.

850 *CMS* II,6 no. 157.

851 See Chapter 1, n. pp. 78–79, n. 331.

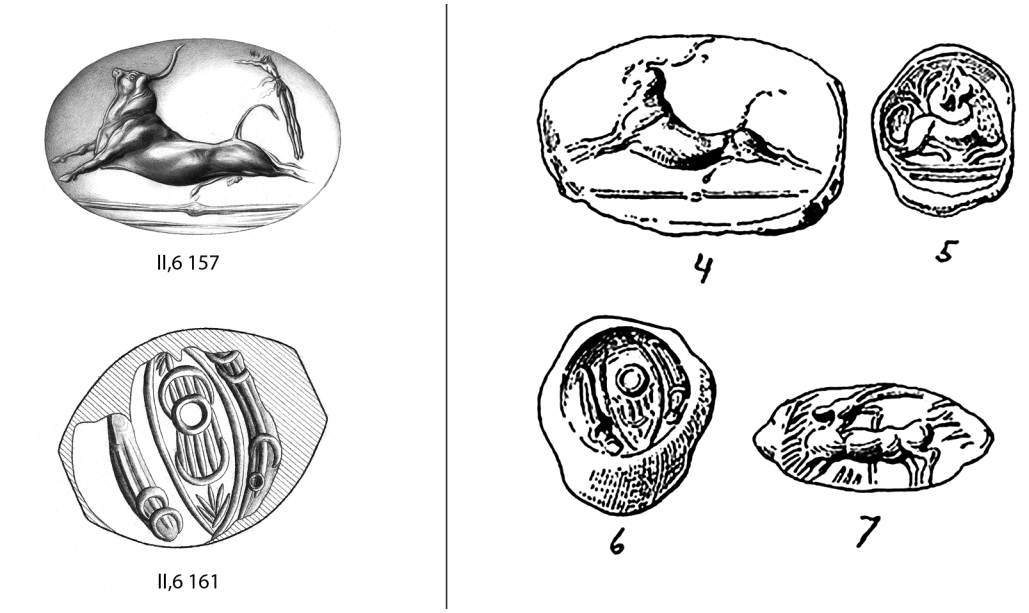


Fig. 99. Administrative documents from Gournia (with impressions of *CMS* II,6 nos. 161 (4), 160 (5), 157 (6), 158 (7); left: *CMS* Archive; right: Hawes *et al.* 1908, 54, fig. 30; courtesy of the University of Pennsylvania Museum of Archaeology and Anthropology).

stamped by only seven different seals. Fresh investigations at Gournia from 2010 onwards have revealed additional documents, which constitute the most recent administrative evidence from Crete: a Linear A tablet, a roundel, a *nodulus*, a flat-based nodule and a single-hole hanging nodule, raising the number of stamped documents from Gournia to 20.[852]

MALIA

An important deposit comprising many incised and stamped documents was retrieved in 1922 at the palace of Malia.[853] This Malia palace deposit remains unique to this day, on account of two factors: the co-existence of Cretan Hieroglyphic and Linear A documents within the same deposit; and its date, namely the later part of MM III,[854] illustrating a stage in the development of Minoan administration that is otherwise unattested.[855] The specific dating of this deposit evidently accounts for the co-existence of a crescent-shaped

852 Younger, in Watrous *et al.* 2015, 443–51.

853 Chapouthier – Charbonneaux 1928; Chapouthier 1930; *CMS* II,6 nos. 168–172.

854 The dating of the deposit, although not without problems, is universally accepted to be the later part of MM III: from the outset Chapouthier (1930, 6) dated the context to MM III; some years later he retracted the date based on further investigations that he conducted in other parts of the palace and suggested a date at the beginning of the MM period (Chapouthier 1947–48, 406). However, later investigations by Pelon verified the original dating (Pelon 1982, 189–90; 1983, 701–03). Some reservations have been expressed as to the unity of all objects/documents attributed to this deposit since one of the seals used was clearly later (*CMS* II,6 p. 189).

855 But see now Hallager 2012.

nodule,[856] two roundels,[857] and one flat-based nodule.[858] The Malia flat-based nodule is the earliest securely-dated example, supporting the view that this nodule-type belonged to an administrative system which had already been established by the later phase of MM III.

SKLAVOKAMBOS

A significant batch of sealings was found at the site of Sklavokambos in central Crete during excavations conducted by Marinatos in the early 1930s (probably between 1930 and 1932).[859] Marinatos excavated a building, which he called 'μέγαρον' ('villa'), situated at a distance of 21–22 km W of Herakleion. The building was not in fact isolated, but was surrounded by other buildings, making it part of at least a hamlet.[860] Sklavokambos is situated in a valley on the main route from Knossos and Tylissos to Gonies. The economic importance of Gonies, a hilly area, lies in the fact that it constitutes one of the two main sources of serpentine on the island, a soft stone frequently used for the manufacture of vases and seals in Minoan Crete.[861]

The building had two storeys and, to judge from different floor levels and movable finds, the ground level was organized in three distinct sectors (*Fig. 100*): the 'living quarters' (Rooms 1–10), the 'magazines' (Rooms 11–12) and the 'service' sector (Rooms 14–20), which included food preparation spaces. The 'living quarters' were deemed the most lavish sector, and were thought to include the equivalent of a palace's 'throne' room (4), custodial quarters (2–3), dormitories (9–10), a 'shrine' (8), a staircase leading to the first floor (6–7), and even a lavatory (Room 7, the *sottoscala*). Signs of intense conflagration lead to the conclusion that the building was destroyed by fire, thus preserving the impressed nodules.

The nodules — termed 'σήμαντρα' by Marinatos, who had a profound knowledge of ancient Greek authors[862] — were found in a single batch in the entrance corridor 1, at a height of 1 m from the floor. This led the excavator to suggest that they had been originally kept in a room on the first floor; the fact that one sealing was retrieved in the adjacent Room 2 was seen as corroborating this interpretation. The finds from the vicinity of the sealings included a stone hammer, a clay human foot,[863] and part of a cylindrical vase with reed decoration.

Marinatos recovered 39 sealings, all except one being flat-based nodules.[864] He detected three different clay qualities among the sealings, noting that the clay was fine and had no impurities, but that the colours differed: red/red-brown, pale ('almost white') and grey.

856 One specimen: HMs 1402, *CMS* II,6 nos. 171, 172 (*Hörnchenplombe*).

857 *CMS* II,6 nos. 169–170.

858 *CMS* II,6 no. 168; Chapouthier 1930, 10, 18. See also above, p. 178.

859 Marinatos 1939–41.

860 Fotou 1997, 47, figs. 7, 8.

861 Warren first noticed the serpentine outcrops in the area, subsequently included in later accounts (Warren 1969, 138–39; Becker 1976, 363–64, 368; Jones *et al.* 2007; more recently: Athanasaki 2014, 68 and 70).

862 Marinatos 1939–41, 87, n. 3. Marinatos cites from Hdt. 2.121B: '*τῶν τε σημάντρων ἐόντων σόων*' (the seals were unbroken); Hdt. 2.38: '*γῆν σημαντρίδα ἐπιπλάσας ἐπιβάλλει τὸν δακτύλιον*' (then smears it with sealing-earth and stamps it with his ring). The two passages refer to sealings used to secure doors and also testify to a specific clay prepared especially for sealings.

863 Marinatos 1939–41, 72–73, pls. 3.3, 3.4.

864 Marinatos 1939–41, 87–93, figs. 13–15, pls. 3.1, 4; *CMS* II,6 nos. 255–272.

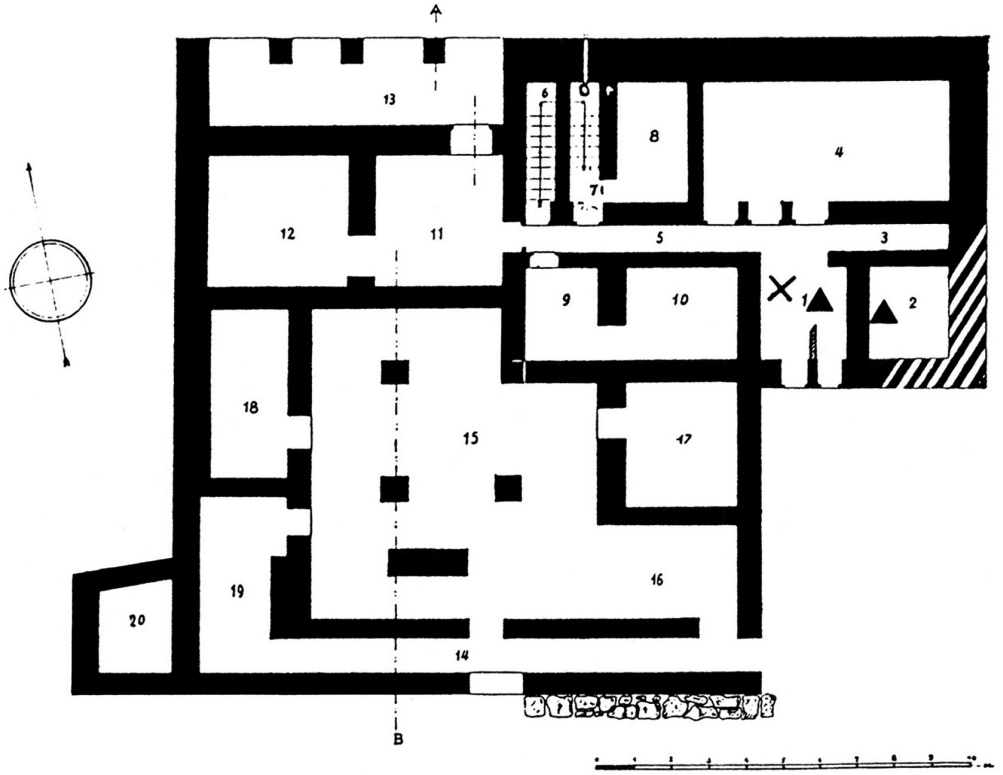


Fig. 100. The Sklavokambos 'villa'; the findspots of sealings are marked with triangles (flat-based nodules) and a cross (*noduli*) (Hallager 1996, 71, fig. 27; image courtesy of E. Hallager).

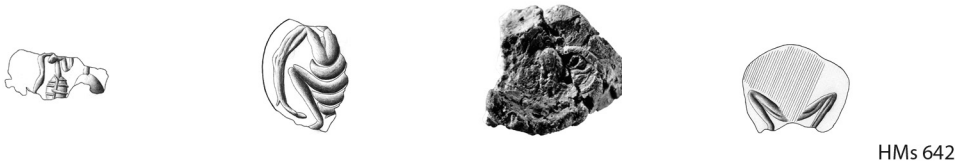


Fig. 101. A unique flat-based nodule from Sklavokambos with impressions of four different seals; scale: 3:2 (HMs 642 = *CMS* II,6 nos. 267, 268, 270, 269) (*CMS* Archive).

Since colour differences had been noted among sealings from other sites in Crete, Marinatos thought of different origins for the nodules. He divided the nodules on the basis of shape: the 'discoid', apparently flattish in appearance with one seal impression; the 'conical', including one with no cord impressions on the back, which he considered a trial piece;[865] and the 'prismatic', with up to four seal-impressions. The last evidently refers to a nodule bearing four different impressions, which is unique amongst flat-based nodules from all sites (*Fig. 101*).[866]

865 *CMS* II,6 no. 261: it is in fact a *nodulus*.
866 HMs 642 (*CMS* II,6 nos. 267–270).

Among the Sklavokambos sealings Marinatos also identified impressions from the same ring that had stamped nodules found at Gournia and Agia Triada.[867] This led him to suggest that the matching impressions pointed to the contemporaneity of the relevant deposits and, consequently, that the disasters responsible for burying them in debris were contemporaneous throughout Crete.[868] The fact that the same ring had produced impressions on nodules found in various parts of Crete was taken by Marinatos as proof that 'a central authority corresponded with all the local centres'. Whether the correspondence was commercial or administrative, directed from the centre to its dependencies, was left open.

In a further refinement of his observations, Marinatos suggested that the flat-based nodules sealed 'letters or other documents in papyrus'.[869] He based his assumption on 'the thin threads on the back of the seals', with which 'only letters could be fastened, not "commercial parcels" or other heavy objects'. Another argument he used was the suitability of the Minoan script for 'writing', i.e. painting with a brush, rather than 'printing', i.e. impressing with a stylus the clay surface, as in Mesopotamia. In his days, two cups with painted inscriptions from Knossos provided evidence that Minoan characters were also executed in ink.[870]

CHANIA

The sealing deposit in Katré Street, Chania, is the most recently discovered in Crete, since all the finds mentioned previously were pre-war discoveries. The deposit came to light in excavations conducted in 1973 and 1974 and was presented to the public relatively quickly.[871] A burned destruction layer contained impressed clay nodules and some roundels in close proximity to each other; further away a cluster of more roundels was detected, and Linear A tablets were recovered from throughout the layer. The finds were considered as the remains of a proper archival deposit, in the sense of a cluster of clay administrative documents originally kept together. Whether or not there had been a room reserved especially for this purpose was unclear, since the finds were not *in situ*, but were thought to have fallen from an upper floor of a poorly-preserved building nearby. The pottery associated to the archival deposit provided a dating at the end of the LM I period.

867 Recent research has corroborated two of his three suggestions that the same ring was used: impression *CMS* II,6 no. 259 = HMs 628/629 (flat-based nodules, Sklavokambos) comes from the same ring as *CMS* II,6 no. 11 = HMs 101 (*nodulus*, Gournia), as well as *CMS* II,6 no. 43 = HMs 497–499 (flat-based nodules, Agia Triada). Also: *CMS* II,6 no. 20 = HMs 632–635 (Sklavokambos) and *CMS* II,6 no. 19 = HMs 516/591 (Agia Triada). The comparison which is not valid is between *CMS* II,6 no. 258 = HMs 625 (Sklavokambos) and *CMS* II,7 no. 36 = HMs 12 (Zakros). For all these matches, see *Fig. 106*.

868 It was the excavations conducted by Marinatos at Amnisos which led him to formulate his theory on the simultaneous destructions of Neopalatial Crete caused by the volcanic eruption of Thera. The material from Sklavokambos and most particularly the nodules were used as supplementary evidence (Marinatos 1939, esp. 429–30).

869 Marinatos 1951, 40.

870 Marinatos 1951, 39–40. Nowadays more painted inscriptions are known, including a unique instance in Cretan Hieroglyphic (*CHIC* no. 322), some more in Linear A (*GORILA* IV pp. 117–27; also, Perna *et al.* 2005) and the Linear B examples found on numerous stirrup jars (Haskell *et al.* 2011).

871 Papapostolou 1977; *CMS* V Suppl. 1A nos. 151–183; an informative discussion in Hallager 1996, 50–51.

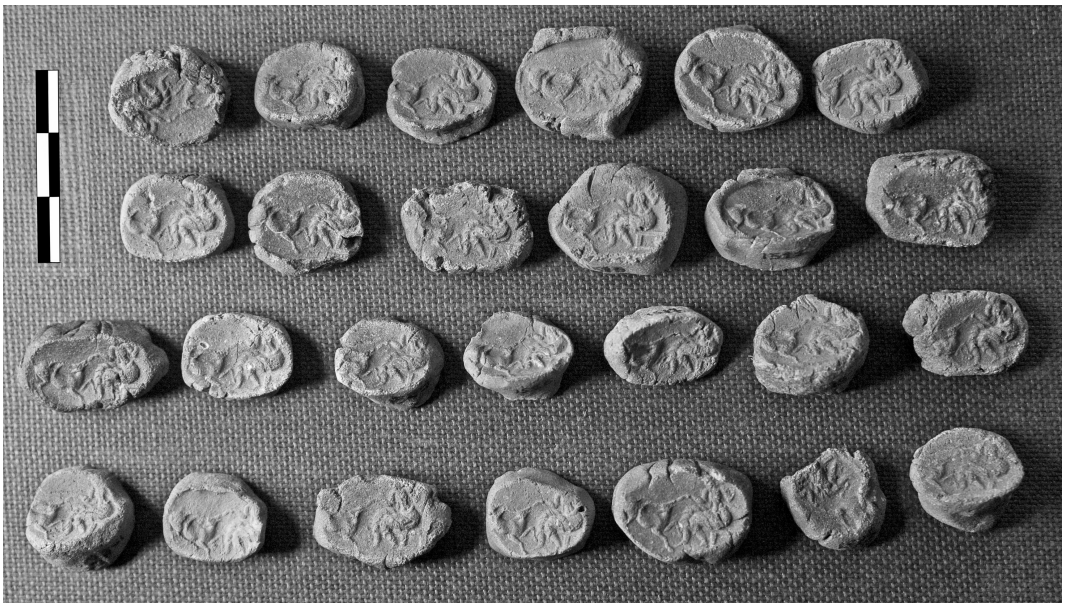


Fig. 102. Twenty-six flat-based nodules from the deposit in Katré Street, Chania, with a single impression each executed by the same seal (ChM 1501–1526 = *CMS* V Suppl. 1A no. 175; Archaeological Museum of Chania © Ministry of Culture and Sports/Archaeological Receipts Fund, photo by A. Karnava).

The Katré Street deposit[872] mostly comprises roundels amounting to 112 specimens.[873] In addition, it contained six two-hole hanging nodules, 20 single-hole hanging nodules,[874] 57 flat-based nodules and just one *nodulus* (*Fig. 102*).[875] Last but not least, 82 Linear A tablets accompanied the sealings.

Nodules in Publications and the 'Replica' Rings Theory

The most thorough presentations of Cretan Neopalatial sealings and their seal impressions are now to be found in the *CMS* volumes published in 1998,[876] 1999,[877] and 2002.[878] These volumes are also accompanied by fairly extensive commentaries and tables on sealing typology and classification, prepared chiefly by Müller.[879] The first attempt to present this kind of material in a *CMS* volume occurred in 1970, with the publication of the Protopalatial sealings from Phaistos, but there the focus was purely on the iconography of the impressions.[880] By contrast, the pioneering work by Fiandra in the late 1960s had concen-

872 More sealings were retrieved from the square of Agia Aikaterini: *CMS* V Suppl. 1A nos. 127–150.
873 Hallager 1996, 25, 50–51.
874 The excavator called them 'prismatic sealings', but the name has not been used since.
875 58 pieces were listed as 'simple sealings', yet one was later identified as a *nodulus* (Weingarten 1986a, 6 no. 10).
876 *CMS* II,7 (Zakros).
877 *CMS* II,6 (Agia Triada and other minor sites).
878 *CMS* II,8 (Knossos).
879 *CMS* II,6 pp. 339–99; II,7 pp. 271–77; II,8 pp. 24–93.
880 *CMS* II,5. No sealing typology was presented and all nodules were termed as 'Tonklumpen'.

trated on the key question of how the Phaistos sealings were used.[881] Weingarten offered valuable insights into Aegean administrative cycles mostly in the 1980s and 1990s. But Hallager's 1996 publication still remains the most comprehensive study of Minoan administration, although it ostensibly focused on a particular document type, the roundel.[882]

Over the years, a variety of theories have been formulated regarding the functions, nature and role of sealings in Neopalatial political and economic organization. Many tentative suggestions, however, have been considered as solid facts and have formed the basis for further interpretations regarding political economy, trade, and power structures in the prehistoric Aegean. The primary material itself is sometimes poorly published, containing errors and misinterpretations. Indeed the question is rarely posed as to what constitutes the adequate publication of administrative documents such as sealings. While inclusion in a corpus of seals and sealings is obviously a first step, the main emphasis of the *CMS* volumes remains iconography, and only limited information on contexts is provided; coverage of individual nodules *qua* nodules is minimal. Thus the *CMS* merely serves as a working tool for further detailed research into the role that sealings played in administration at site or regional level.

Given the popularity of iconographical studies for much of the 20th century, much discussion has centred on the seal motifs attested on the sealings. A key article by J. Betts on Neopalatial sealings and administration, however, set a new research agenda that still resonates today.[883] Betts built on Marinatos' observation that certain ring impressions recovered at Sklavokambos, mostly with a bull-leaping theme, matched impressions found at Gournia and Agia Triada, i.e. that sealings impressed by the same rings had been dispersed in different Cretan sites; he verified that this was the case in certain instances, but he also noticed that a number of different seals with similarly rendered themes had been involved. With this article he established firmly the term 'replica' for these rings, which had been first used by Evans for the impressions of rings with similar motifs;[884] he considered the rings as 'practically indistinguishable replicas of the same ring' (*Fig. 103*). He further suggested that the clay of sealings with 'replica' ring impressions seemed to indicate an origin local to the sites where they had been found, such as Agia Triada, Gournia, Knossos and Zakros. This led him to conclude that it was not the sealings with duplicate impressions that travelled from one site to another, but the ring itself in the hands of its owner, or, more probably, its replica in the hands of his representative. Betts spoke of official correspondence, but because he ultimately believed that it was the seal bearers and not the documents that travelled, he promoted Knossos to the status of the administrative centre that controlled the movement of administrators, and their replica seals as the insignia of their master(s).

In recent years other scholars have focused on the problem of the so-called replica rings. It has emerged that the term is confusing and has been used with a variety of meanings, which do not always coincide. It used to be widely believed, for instance, that the 'replica' signet rings were probably manufactured by use of a mould. More recent and detailed investigations have demonstrated that all Minoan rings with gold bezels were hand-made

881 Fiandra 1968. The first scholar who discussed the role of sealings in the Aegean was however Heath (1958).

882 Hallager 1996.

883 Betts 1967.

884 Evans 1928b, 832, n. 1, where Evans uses the expression 'almost exact replica'.

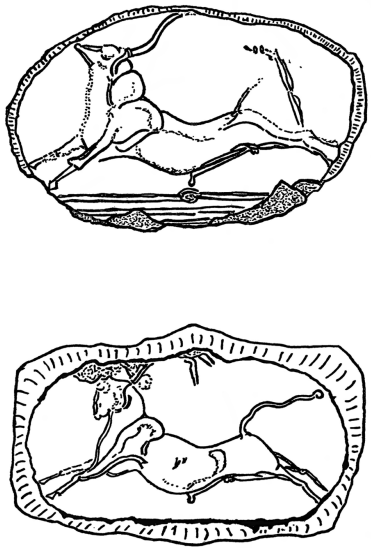


Fig. 103. Nodules from Gournia: HMs 101 (top), impressions from the same ring (now *CMS* II,6 nos. 43/161/259/II,7 no. 39) on sealings at Agia Triada, Sklavokambos, Zakros and Gournia; HMs 102 (bottom), impressions from the same ring (now *CMS* II,6 nos. 44/162/255) on sealings at Agia Triada, Sklavokambos and Gournia (Betts 1967, 29, fig. 1).

and were not produced in moulds.[885] Moreover, one of the problems of proving Knossian control in Neopalatial administration is the scarcity of sealings at Knossos dating to this period, and a complete absence for LM IB.[886]

Hallager took 'replica' rings to be 'large gold rings, presumably manufactured at Knossos, the impressions of which have been found at six different sites on LM IB Crete … 53 impressions have been identified from ten such rings'. The bezels of these rings, with a length of c. 3 cm, also displayed a limited number of seal motifs, namely bull-leaping, a chariot scene, running lions, and combat scenes.[887] Hallager further distinguished between 'Knossian' and 'local replica rings' of a maximum length of 2 cm, which he suggested had been manufactured locally with the same themes as the Knossian rings.[888] Additionally, based on stamping patterns and motifs attested at Knossos and, more importantly, Zakros, the term 'look-alikes' has been applied by Weingarten to seals with similar motifs that were used within the same site as 'stamping partners'.[889] The term is meant to refer to 'seals that must have been made intentionally similar, in order to assert similar authority within some closed group'. An additional premise was that these seals would have been 'used in a similar way and preferably in a way that is virtually interchangeable' (*Fig. 104*).[890]

885 Sakellarakis 1981; Krzyszkowska 2005a, 131.
886 Krzyszkowska 2005a, 121.
887 Hallager 1996, 207, fig. 77.
888 Hallager 1996, 209–13, fig. 78.
889 Weingarten 1986b; 1989; 1994, 183. See also: Pini 1983.
890 The latest treatment in Weingarten 2010a, 400, n. 12.

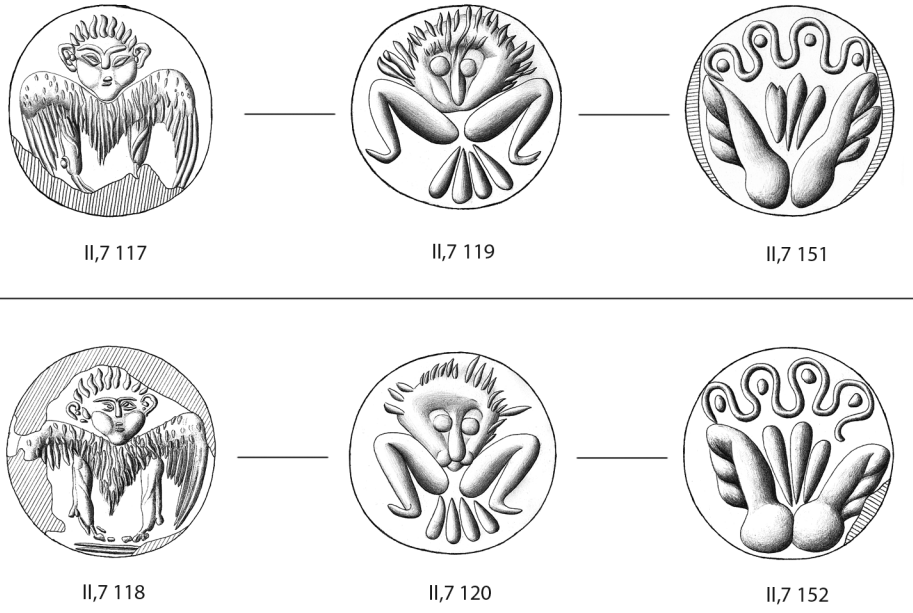


Fig. 104. Seal impressions *CMS* II7, nos. 117, 119 and 151, all attested together on fourteen flat-based nodules from Zakros (HMs 10/1, 3–6, 9–15, 17, OAM AE 1199m); and seal impressions *CMS* II7, nos. 118, 120 and 152 attested together on three flat-based nodules from Zakros (HMs 10/7, 16, OAM AE 1199w) (*CMS* Archive).

The non-specificity of these terms has, however, caused their misuse, with the result that the terms 'replica' and 'look-alike' are sometimes used indiscriminately and loosely.[891] Nevertheless, it seems that scholars subconsciously reserve the term 'replica' for large gold rings with their restricted range of themes, whereas the term 'look-alike' is applied to seals, including those of stone, with similar motifs, but where the thematic range is not so specific.

However one chooses to name or describe the situation, there is nonetheless a real research puzzle here, which goes to the very heart of Minoan glyptic and was even passed down to Mycenaean seal engraving. How significant was a seal motif? Did it stand for a notion, an idea, or a principle? And if so, to what extent was it recognizable, accepted, and respected through time and space? Minoan glyptic imagery drew inspiration from the natural — including the human — environment, but also created purely ornamental and fantasy motifs.[892] Almost from the outset the various kinds of motifs became a standardized form of artistic expression, one that was organized through 'workshops', obeyed certain traditions, but also followed and created trends.[893] Even for the very beginnings of Minoan glyptic in the mid-third millennium questions arise regarding seals with similar motifs, while the Minoan Protopalatial period appears to have presented the same vexing problem.[894]

891 For instance: Schoep 1999b, 213–17. For a review of the term, see Krzyszkowska 2005a, 182–84; also, the discussion in Pini 2006.

892 Crowley 2013, 349–52.

893 The most recent effort to trace 'masters' and 'workshops' among golden signet rings: Becker 2011–12.

894 Anderson 2013, 119–20, who calls similar motifs 'undifferentiated motifs'; more recently on the same topic, Anderson 2016, esp. 48–80; also Sbonias 1999; 2000; Relaki 2009, 357–58; 2012.

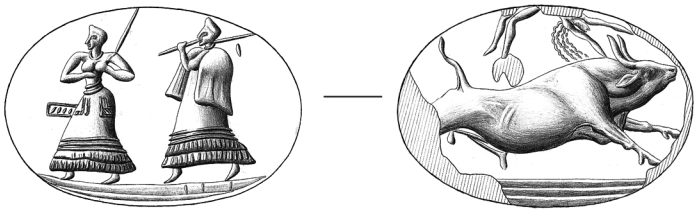
Some motifs evidently circulated widely in a particular period (see, for instance, *Fig. 66*) but to what extent were they distinguishable or meaningful? The problem of distinguishing between 'geometric' motifs, e.g. cross-hatching, on seals and their impressions is potentially as important as telling one 'naturalistic' scene from another on different seals and seal impressions apart, as in the case with the pluralism of the bull-leaping scenes.

As far as the Akrotiri sealings are concerned, they attest to the use of two seal rings that can be labelled 'replica' rings, as understood by Betts and Hallager. One bears the motif of a chariot scene[895] and the other a bull-leaping scene (*Figs. 63, 65*);[896] both had been used to stamp (different) flat-based nodules. The ring with the chariot scene had stamped three flat-based nodules on its own; the ring with the bull-leaping scene had stamped five flat-based nodules on its own, a further 28 together with another seal,[897] and two more together with yet another seal (*Figs. 72, 77*).[898] It is uncertain whether the impression of a third large-sized metal signet ring showing a building and two bovines should be taken as a 'replica' ring impression in the sense Hallager uses it, since its theme does not strictly fall among the topics prescribed by him.[899] Also, a ring of more modest dimensions with a bull-leaping/grappling scene had stamped nine flat-based nodules with one other seal;[900] this ring could probably qualify as Hallager's 'local replica ring' on the basis of its size and motif. More importantly, perhaps, among all the sealings retrieved at Akrotiri there are no impressions of 'look-alike' seals, as defined by Weingarten, which are so prominent among the Zakros material. No reproduction, intentional or unintentional, can therefore be observed among the seal impressions from Akrotiri.

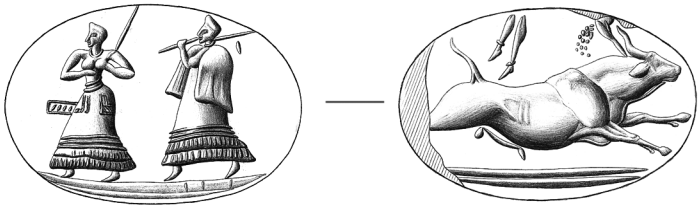
But, as a matter of fact, the by now customary perception of 'replica' rings needs to be seriously revised, since we understand today that the fundamentals of this narrative are somewhat different than previously thought. Firstly, it is important to stress that the whole discussion is being conducted on the basis of seal impressions and not seals, i.e. any question about the similarity of motifs relates to how they functioned within the administrative realm and does not necessily have broader repercussions. That said, there appear to be three different phenomena lurking behind the 'replicas' and 'look-alikes' of the Neopalatial period, the third of which also appears to be relevant in the case of Akrotiri:

First phenomenon: the production of seals for administrative purposes with similar themes. These seals seem to render a specific motif, but in all likelihood they did not replicate one another; this is the instance of the bull-leaping motif, as it has been explained and illustrated previously (*Fig. 66*).[901] If the exact replication of another seal had been the purpose, then an effort would probably be made to produce 'copies' as faithfully as possible; if such were the case, the leaper, for example, would not appear in distinctly different positions, or the engraver would make sure that the bull had its head turned to one specific direction, and so on. At this point, it seems that the term 'replica' is wholly inappropriate for such motifs; but there is no suitable replacement for it, since similarly themed seals do not necessarily

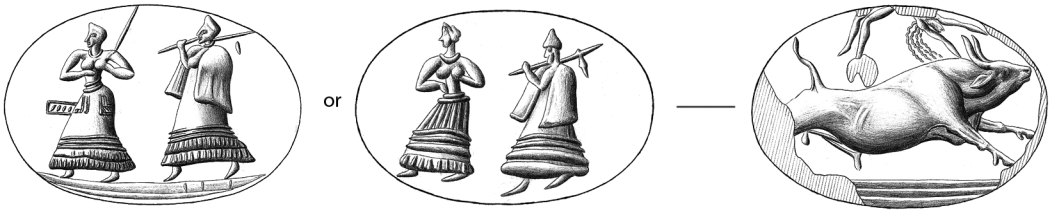
895 *CMS* V Suppl. 3 no. 391.
896 *CMS* V Suppl. 3 no. 392.
897 *CMS* V Suppl. 3 no. 393.
898 *CMS* V Suppl. 3 no. 394. For these pairs of seals/seal bearers, see further below, pp. 197–200, 203–10.
899 *CMS* V Suppl. 3 no. 404.
900 *CMS* V Suppl. 3 no. 395.
901 See Chapter 2, pp. 121–24, 152–53.



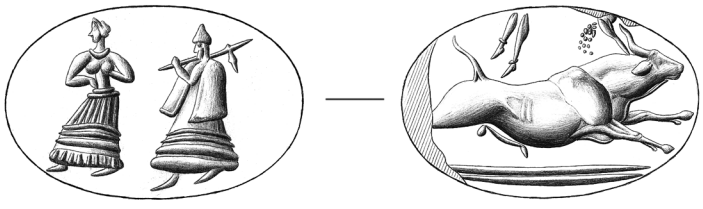
II,7 16 — II,7 37



II,7 16 — II,7 38



II,7 16 or II,7 17 — II,7 37



II,7 17 — II,7 38

Fig. 105. Seal impressions from Kato Zakros, House A: *CMS* II7, nos. 16 and 37 attested on eleven flat-based nodules (HMs 17/1, 4, 5, 12, 17/29, 18–20, 27, 31, 33); *CMS* II,7 nos. 16 and 38 attested on flat-based nodule HMs 17/15; *CMS* II,7 nos. 16 or 17 and 37 attested on flat-based nodule HMs 37/1; *CMS* II,7 nos. 17 and 38 attested on 18 flat-based nodules (HMs 17/2, 3, 8–11, 13, 14, 16, 17, 21, 22, 24–26, OAM AE 1199p, 1199z, without inv. no.), but also on three two-hole hanging nodules (HMs 17/6, 7, 34) (*CMS* Archive).

constitute a group or a category. For a category to be created, one would have to come up with more and potentially specific criteria other than the common theme. Among the Akrotiri sealings, bull-themed impressions abound (*Fig. 108*), while some fragmentary impressions coming from different seals could be mistaken for one another; yet, it is clear that none of the seals copied any of the others, that they all fell within close thematic relevance to one another, but under no circumstances can or should they be grouped together.

Second phenomenon: the intentional duplication of specific seals that, as Weingarten suggested, were meant to replace a seal of similar capacity or function within the administrative system. These seals would fall under her term 'look-alikes', but since there seems to have been intentional copying, they qualify as true replicas, i.e. copies of original seals. These 'look-alikes' can be discerned among the Zakros material, where the copies of three specific seals that had been jointly used were made to be used again all together (*Fig. 104*).[902] The degree of similarity or differentiation between motifs can admittedly be subjective, but the Zakros material leaves little room for subjectivity on the matter. What appears to have caused the mixing up of the seals formerly known as 'replicas' with 'look-alikes' is the fact that among similarly-themed seal impressions, such as those from seals sharing the bull-leaping theme (the first phenomenon, *Fig. 66*) we also encounter 'look-alikes' (the second phenomenon, *Fig. 104*) which seem to have filled in for one another (*Fig. 105*). The two phenomena therefore are different, the former being broader than the latter, but they also intersect. As stressed previously, this phenomenon is nowhere to be detected among the Akrotiri sealing material.

Third phenomenon: the one that is of paramount interest to the Akrotiri material. It consists of signet rings that stamped sealings which were subsequently found in different locations in Crete, as well as Akrotiri. The ring with the chariot scene attested at Akrotiri was also used to seal two flat-based nodules found at Agia Triada,[903] and four flat-based nodules found at Sklavokambos.[904] Further cases exist where the very same ring had been used to stamp sealings found at different locations, naturally giving rise to much scholarly interest (*Fig. 106*).[905] To date four matches have been established — two bull-leaping scenes, a chariot scene, and a combat scene — distributed on different sites: Agia Triada, Gournia, Sklavokambos, Zakros (palace), Knossos, and now, Akrotiri in Thera. Some consternation has arisen from the fact that the Akrotiri impressions are dated, along with the final volcanic destruction of the site, to a mature phase of LM IA, whereas the sealings found on Cretan sites come from LM IB destruction horizons.[906] This leaves a gap of some 80–120

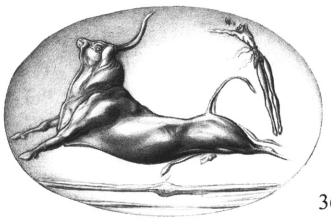
902 But they appear to have existed already among the Phaistos Protopalatial material (Weingarten 1992, 32; Relaki 2012, 308–13).

903 *CMS* II,6 no. 19: it was the sole impression on one nodule (HMs 591), and on a second nodule (HMs 516) it was paired with another ring (*CMS* II,6 no. 41).

904 *CMS* II,6 no. 260: the sole impression on HMs 632–635.

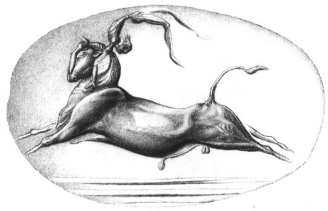
905 For all the basic facts, see Krzyszkowska 2005a, 188–92 and nos. 368–371 (reproduced here as *Fig. 106*, with adaptation).

906 Although the Akrotiri LM IA volcanic destruction and the widespread LM IB destructions in Crete are generally viewed as events distant in time, a recent study has proposed their (near) synchronization (Platon 2011).



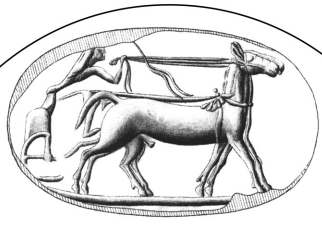
368

Ayia Triada (*CMS* II.6 no. 43)
3 flat-based: 1 impression (HMs 497-499)
Gournia (*CMS* II.6 no. 161)
1 nodulus (HMs 101)
Sklavokambos (*CMS* II.6 no. 259)
2 flat-based: 1 impression (HMs 628-629)
Zakros Palace (*CMS* II.7 no. 39)
1 *nodulus* (HMs 1051)



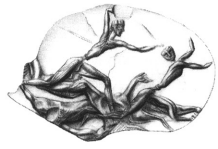
369

Ayia Triada (*CMS* II.6 no. 44)
1 flat-based: 1 impression (RMP 71974)
Gournia (*CMS* II.6 no. 162)
1 flat-based: 1 impression (HMs 102)
Sklavokambos (*CMS* II.6 no. 255)
1 flat-based: 1 impression (HMs 612)



370

Akrotiri (*CMS* V Suppl. 3 no. 391)
3 flat-based: 1 impression
Ayia Triada (*CMS* II.6 no. 19)
1 flat-based: 1 impression (HMs 591)
1 flat-based: 2 impressions (HMs 516)
(combined with II.6 no. 41)
Sklavokambos (*CMS* II.6 no. 260)
4 flat-based: 1 impression (HMs 632-635)



371

Ayia Triada (*CMS* II.6 no. 15)
3 flat-based: 1 impression (HMs 526/1-3)
2 flat-based: 2 impressions (HMs 595-596;
combined with II.6 no. 4, here **245**)
Knossos (*CMS* II.8 no. 279)
2 single-hole hanging (HMs 369, 1275)

Fig. 106. Impressions of four different rings, the multiple attestations of which were found in different sites in Crete and, now, Akrotiri (after Krzyszkowska 2005a, 190 nos. 368–371; image courtesy of O. Krzyszkowska).

years between the use of the chariot scene ring for the Akrotiri nodules and those recovered from Agia Triada, Gournia and Sklavokambos.[907]

907 The matter from the point of view of the Akrotiri sealings is discussed in Karnava 2011. The discrepancy between ^{14}C 'high' (most recently supported by Friedrich *et al.* 2006) and traditional 'low' chronologies offered for the volcanic demise of Akrotiri has been debated *ad nauseam*. An interesting discussion took place in *Radiocarbon* 54 (2012, especially articles by Höflmayer and Wiener). More recently, another round of papers dismissed the 'high' date (*Antiquity* 88.339 [2014]: 267–91), which was then further supported by Manning *et al.* 2014; now, see also Mühlenbruch 2017. The most vocal advocate of the 'low' chronology has been Warren (more recently: 2010) with emphasis on the archaeological evidence. So far it has been easier and less controversial to establish the time of the year during which the destructive eruption occurred (early summer: Panagiotakopulu *et al.* 2013) rather than the year itself.

Although the primary data for our inquiries is now documented to a high standard, the picture regarding Cretan Neopalatial administration is no clearer. Since Akrotiri is located outside Crete it offers another parameter to questions concerning the role and purpose of such sealings. Matters are complicated enough when dealing with the Cretan evidence; and there is certainly no consensus as to the political situation during the *floruit* of Minoan culture. The perennial question remains unchanged: are we seeing a single political authority based at Knossos, administering the whole island and even Akrotiri; or a decentralized model of political organization, where the dispersal of administrative documents in multiple sites points to a fragmented political landscape? Furthermore, this question can now be posed for both LM IA and LM IB, since our evidence spans the two periods.

STAMPING PATTERNS AMONG THE AKROTIRI FLAT-BASED NODULES

One of the primary questions that defined the present study is the following: are the 67+ flat-based nodules in D18b a single hoard, or do they present characteristics that hint at some sort of collection, comprising homogeneous and/or heterogeneous specimens of sealings? One possibility is that all the nodules were brought together in a single journey from Crete. Alternatively, they might have been imported in batches, or even singly, over an unknown period of time, yet ended up being stored together with previous shipments. Concerning their point of origin, it is also worth asking whether they all came from the same locality on Crete. Even if this could be resolved definitively, the problem still remains as to whether they represent a single event or were made at different points in time, collected and subsequently dispatched.

It is clear that these issues concern the potential existence and maintenance of archives in the Minoan world, and how these were formed. For instance, what are we to make of the 555 nodules found in a single hoard in Zakros' House A, and the 73 nodules from Akrotiri D18b? What time span do they represent, how long did it take for them to be accumulated, and how were the sealings distinguishable from one another, if at all, once they entered their archival resting place?

In attempting to answer some of these questions, this study has concentrated on how flat-based nodules, which constitute the majority at Akrotiri, behave, i.e. whether any repetitive phenomena in seal use are revealed. Repetition would betray stamping patterns and is thought to reveal information about administrative habits and practices.

Clay Paste Varieties among the Flat-Based Nodules

The Akrotiri nodules are unfired, since we have no evidence of any fire destruction that preceded the final volcanic destruction.[908] The ultimate proof for the absence of high temperatures, even during the precipitation of volcanic materials during the eruption, is the excellent preservation of organic materials — wooden beds and musical instruments;[909]

908 See also Chapter 2, p. 81.
909 Mikrakis 2007.

Clay Paste	Specimens	Clay Colour	Inclusions	Observations
A	**N1–N4, N8, N11–N44, N63, N66–N67, N72–N73**	reddish-brown	no (none visible)	black speckles on the surface (organic residues) on almost all specimens
B	**N5–N7**	yellowish-brown	no (or very few)	–
C	**N9, N45–N62, N65, N68**	reddish-yellow	sizeable	with pores/voids resulting to a sponge-like clay paste
D	**N69**	reddish-yellow	no (or very few)	black speckles on the surface (organic residues)
E	**N70**	reddish-brown	no (none visible)	black speckles on the surface (organic residues)
F	**N74**	brown-red	no (or very few)	–
G	**N75**	red-brown	one large-sized	–
uncertain	**N10, N71**	brown-red, reddish-brown	no (none visible)	–

Table 3. Clay pastes among the Akrotiri flat-based nodules.

straw baskets; ropes and strings made of plant fibres, etc. — in open spaces of the settlement as well as house interiors alike.[910] In our case this means that the clay sealings, as objects that were intentionally left unfired in the first place, preserve the original colour of the clay, which is unusual for clay material from archaeological sites.

At first glance the clay of all the nodules appears uniform and was invariably described as 'chocolate brown' or *rotbraun* in initial presentations.[911] Nonetheless, more meticulous examination of the Akrotiri sealings for this study by this author has lead to the observation that more than one clay paste is discernible macroscopically among the flat-based nodules retrieved in Room D18b. More specifically, at least three qualities of clay paste are clearly distinguishable, and even more are suspected (*Fig. 107*). The differences observed among clay qualities are not only based on dissimilarity in the coloration of the nodules, but also in their texture; the latter were visible on the surface of the nodules as well as their interior. As a general observation, the clay of the nodules is relatively pure in two of the three varieties (A, B) with few or no inclusions at all added. The clay colour and variations in inclusions could suggest multiple sources for the primary material that is clay, and/or diversified preparation of the clay paste. The clay pastes can be seen in *Table 3*.

910 Michailidis – Angelidis 2006.
911 Doumas 2000b, 59; *CMS* V Suppl. 3 nos. 391–405; Karnava 2008, 381: 'same clay'.

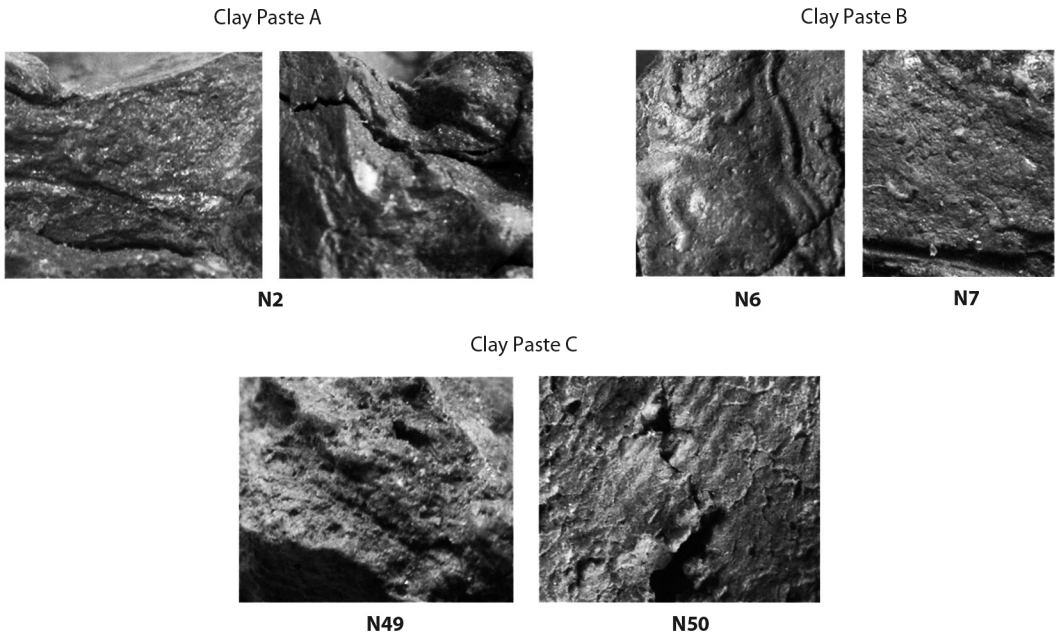


Fig. 107. Clay Pastes A–C attested in the Akrotiri nodules (Akrotiri Excavations Archives/*CMS* Archive, photos by A. Karnava).

Apart from the macroscopic investigation, non-destructive petrological and chemical analyses have been conducted on a number of nodules from Akrotiri and also from different Cretan findspots. The results of these investigations are still pending, but are expected to localize the manufacture of the sealings and hence of their specific origins(s) within Crete.[912]

The distinction in clay pastes, combined with the preliminary results from the petrological and chemical analyses on the Akrotiri nodules,[913] demonstrate that determining the specific provenance of the Akrotiri sealings within Crete is more complicated than previously thought. The fact that different clay pastes co-exist within the same archival deposit, as at Akrotiri, shows that the sealings represent different events in space and probably also in time.[914] The minimal differences between Clay Pastes A and B could point to a provenance within the same site or area in Crete, but might, alternatively, represent a different dispatch or a different point in time.

912 Panagiotopoulos – Goren 2008; Goren – Panagiotopoulos 2009; Tsangaraki 2010a, 319. Some of the information from the preliminary presentation of these studies has been taken up by Weingarten 2010a, 398, where the Akrotiri sealings are designated as 'not local'. In addition, however, Weingarten mistakenly adds that 'The clay of (all but one) of the sealings, according to preliminary analyses, has been traced to north-central Crete, that is to say, the Knossos area.' However, the analyses undertaken by Panagiotopoulos and Goren involved samples from a limited number of sealings from Akrotiri (less than 20) (Panagiotopoulos, pers. comm.). The precise methodology and results of this investigation remain unpublished.

913 Panagiotopoulos – Goren 2008; Goren – Panagiotopoulos 2009.

914 This suggestion finds further support in evidence from the sealings of House A in Kato Zakros (Anastasiadou, pers. comm.).

The clay pastes of the Akrotiri sealings are noted in the Catalogue and will also be discussed later in this chapter, in connection with observations on the stamping patterns found on these sealings.

Pairs of Administrative Seals: Multiple/Dual Stamping

Clay provenance apart, it was already apparent at the initial presentation of the Akrotiri nodules — before they had all been numbered and/or joined[915] — that the overwhelming majority had been stamped by multiple pairs of seals, notably six different pairs, which would normally involve the use of 12 different seals.[916] Closer inspection, however, revealed that three of the seals used actually participated in more than one pair: thus the total number of seals involved in stamping these sealings was, in fact, only nine (*Fig. 108*).[917]

An obvious question at this point is what each impression, i.e. the seal from which it came, represented. It is certain that the very establishment of an administrative system attests to a level of complex and impersonal handling of affairs, where a person's presence or 'word' would not suffice for the execution of an official transaction. Either it would have been impossible for the individuals responsible to be present at all times and at all occasions, or the sheer volume of transactions would have been too large to handle on the basis of oral communication.

The existence of organized administrative state systems is posited for Crete on the basis of the invention of writing, i.e. around the turn of the third to second millennia BC; the institution of writing for book-keeping purposes was concomitant with the appearance of the palaces, the monumental buildings that supposedly functioned, *inter alia*, as the seats of administrative power.[918] The existence of a simple, yet effective administrative system even before the introduction of writing has also been suggested, on the basis of stamped clay 'documents'.[919] By the time the Akrotiri sealings were produced, i.e. the 17th or 16th century BC, administrative procedures in Crete already had a lengthy, complicated but, most importantly, seemingly uninterrupted history. It is widely accepted that the seals used to stamp the sealings were representative of an administrative role, that they symbolized a specific aspect of adminstrative responsibility through the process of authentication. A matter of debate, however, concerns the precise way the system was organized, and also what this organization indicates regarding the political, economic and social structures of the time.

915 Doumas 2000b, 63–64, table 1.

916 The practice has, of course, been noticed before and was given different names: 'multiple stamping' (Weingarten 1994a, 180–81, where it is erroneously described as a practice limited to Knossos and Zakros); 'dual-stamping' (Krzyszkowska 2005a, 165–67).

917 A similar chart appears in Weingarten 2010a, 397, fig. 1, where these sealings are called 'combination sealings'. The drawings of seal impressions included in her illustration are not shown to scale.

918 There is a rich bibliography on this much-debated topic, since the question permeates Minoan studies. The discussion mostly concentrates on whether state formation preceded the construction of the palaces, as well as what the process of this state formation entailed: see numerous papers in the volume Schoep *et al.* 2012, while some counter-arguments to this volume are thoroughly presented in Cherry 2009 and 2012.

919 Pini 1990, 35–37; Vlasaki – Hallager 1995; Schoep 1999a; Hallager 2000; the most recent discussion: Relaki 2009.

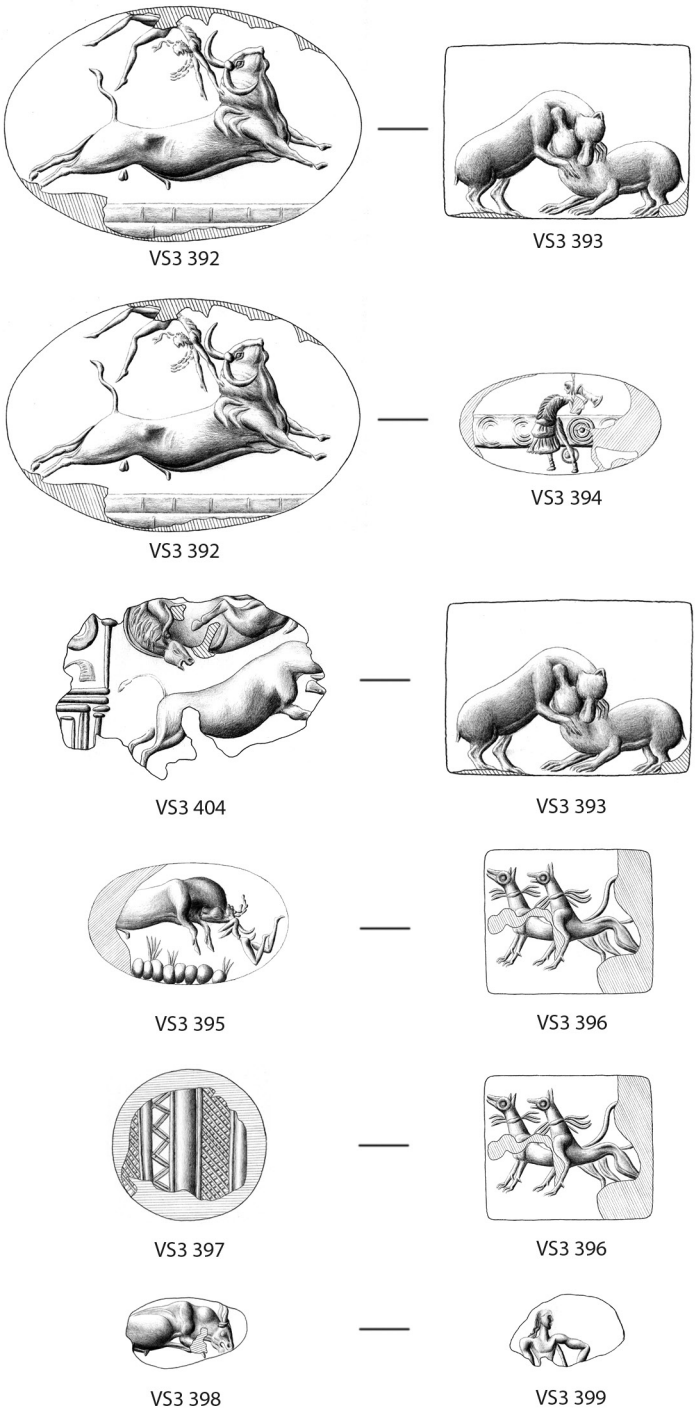


Fig. 108. The nine seals that had participated in six different pairs to stamp the majority of the Akrotiri flat-based nodules (*CMS* V Suppl. 3 no. 392 in two different pairs; V Suppl. 3 no. 393 in two different pairs; V Suppl. 3 nos. 394, 404, 395, 396 in two different pairs; V Suppl. 3 nos. 397, 398, 399); scale: 3:2 (*CMS* Archive).

A vital question in this respect remains whether seals used within the administrative realm functioned as tokens of personal guarantee or as a 'signature' of an impersonal administrative rank.[920] A case cannot be made for all Minoan seals at all times, but an instance stands apart: the Neopalatial seals and gold signet rings, some of which survived into the succeeding periods (LM/LH II–III) mostly as burial goods,[921] would appear to favour an interpretation of these seals at the time of their manufacture less as personal possessions and more as symbols of an impersonal authority of an apparently elevated status. To repeat an argument I have discussed elsewhere: the view that seals were personal possessions rests chiefly on the fact that they accompanied deceased individuals in graves, but this inference is not necessarily valid at all times and places in Minoan Crete. Suffice to say that in the few known graves of Neopalatial date, 'talismanic' seals are common; as previously noted such seals were hardly ever active in the administrative domain.[922] At the present state of affairs, although we can dispense with an *a priori* ownership claim for administrative seals, it is not easy to discern whether their use was personalized or had become impersonal; hence the person handling the seal is not referred to in this work as a seal owner.[923]

Furthermore, when we in modern scholarship constantly refer to seals, sealings and motifs, we try to make use of relatively neutral and thus objective terminology. But our desire for neutrality and objectivity causes us to lose track of the fact that seals were handled by actual people in an administrative capacity, not to mention that it places too much importance on seal motifs as the prime distinguishing factor among seals and their offshoots, seal impressions;[924] the case for this latter assumption remains to be made.

Behind each seal impression we will, therefore, postulate a seal bearer in an official capacity, an administrator.[925] But since the seal was an object that stamped, there is no way of excluding the possibility that more than one person handled the same seal; in such case, one would assume that the seal had become the vehicle of administrative responsibility regardless of the person/people behind it. This could be a second, more advanced level of the abstract symbolism of the authority for which the seal stood.

It has also been suggested that one person might have handled both seals that stamped a sealing, and that this was done simultaneously.[926] This suggestion was based on modern experiments, which showed that it was impossible for the nodule to maintain its shape if the seals were stamped consecutively.[927] The fact that the seals might have been impressed

920 In support of the latter explanation: Schoep 1999b, 213–14; Cain 2001, 28; Tsangaraki 2006, 293–94.

921 Krzyszkowska 2005a, 120. A worn gold signet ring with a bull-leaping motif recently found in a tomb at Pylos in Messenia of LH IIA date can be listed under this trend (Davis – Stocker 2016, 637–39, no. 1, fig. 9).

922 See Chapter 1, n. 331.

923 The seal 'owner' appears frequently in bibliography: Weingarten 1994a, 181; Drakaki 2005–06; Argyrou-Brand 2009, *passim*; Relaki 2012.

924 Krzyszkowska 2005a, 165–67.

925 The identification of clay tablet scribes with administrators who were concomitantly members of an elite body in Mycenaean society has been convincingly advocated (Bennet 2001). A corresponding combination has been attempted for seal owners and elite administrators again in the Mycenaean period (Flouda 2010).

926 Hallager 1996, 205.

927 Hallager 1996, 245–46.

simultaneously is, however, an entirely practical observation. It pertains to the materiality of the document sealing itself, but does not preclude the hypothesis that each seal was indicative of a different person's/official's authority, as Hallager himself recognizes. Furthermore, if simultaneous stamping was in fact a requirement, then it would have been impossible for one person to handle all three seals required for the three-seal flat-based nodules attested at Zakros.

Lastly, in view of how little we know and understand about Cretan Neopalatial administration, we cannot even assume that the nine seal bearers, who eventually paired up in multiple pairs to stamp documents, were active during the same period of time. Even, however, if they were not concomitantly active, it cannot be denied that they somehow belonged to the same administrative circle, since they intermingled and collaborated on more than one occasion.

Groups among the Akrotiri Flat-Based Nodules

The Akrotiri sealings provide still more clues which enhance our understanding of the material. It seems that the sealings produced by the nine seal bearers and, potentially, by two more seal bearers for reasons to be explained below, can be divided into two groups on the basis of three criteria: the direction in which the folded leather document was placed with regard to the nodule, the size of each nodule, and the differences in clay pastes:

Direction of the document with regard to the nodule: Careful examination of the two-seal flat-based nodules from Akrotiri revealed that there were two quite distinct ways of placing the clay on top of the leather document. In both cases a string was repeatedly wrapped around the folded document, on top of it was placed a moist clay lump, and then two seals were pressed against opposite sides of the lump. However, the seal impressions in the two groups of nodules were placed in different directions in relation to the orientation of the folded document (*Fig. 109*). In the first instance (left), the seal impressions were pressed perpendicularly to the direction of the string with which the document was tied, whereas on the second instance (right) they were stamped parallel to it. Whether this technical detail had some specific meaning, other than attesting to different ways of preparing the sealings, is impossible to say. The differences in the manufacture method, however, allow us to clearly distinguish one group of document sealings from another at Akrotiri. It should be added that the seals used on the sealings made by employing the first method are not attested on sealings made by the second method. This feature is combined with two other constant characteristics described immediately below.

Nodule size: The second criterion takes into consideration the measurements of the nodules and those of the sealed documents, which vary considerably (*Fig. 110*). In a number of cases the leather impression is entirely preserved, and often the clay also extended to cover the sides of the folded leather; hence, the dimensions of the original folded leather documents can also be measured with accuracy.

The nodules with perpendicular string are of significantly larger size and secured large- and medium-sized documents. They have an average length of 2.5 cm, average width of

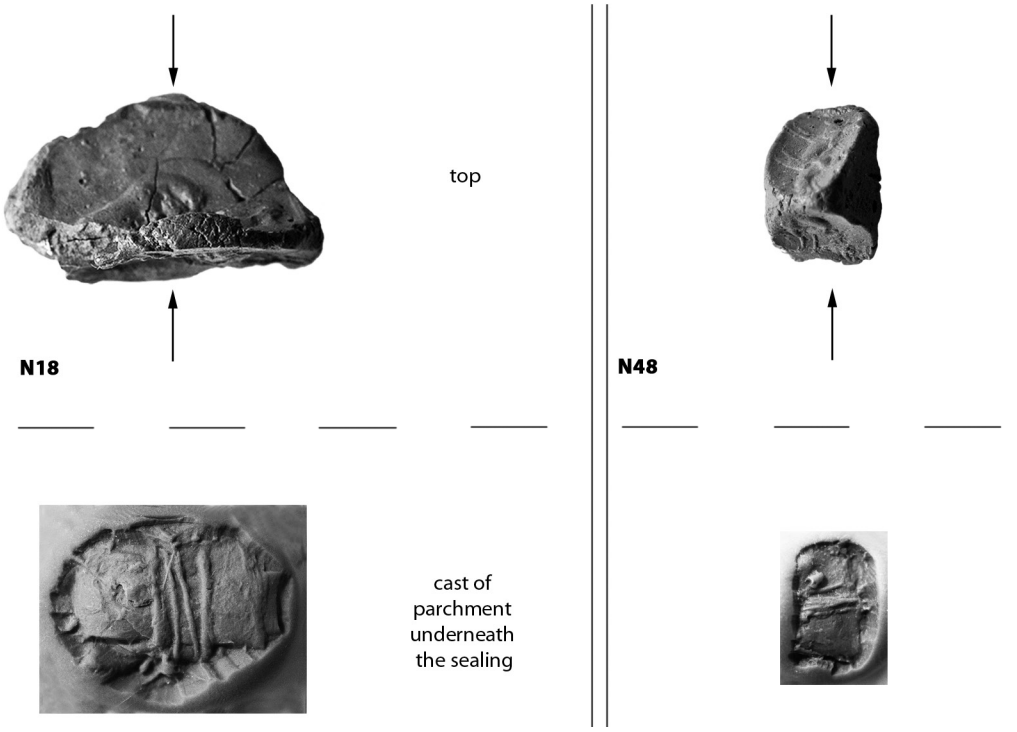


Fig. 109. Two different ways of flat-based nodule preparation: **N18**, seals stamped perpendicularly to the wrapped string; **N48**, seals stamped parallel to the wrapped string. Depicted are the tops of the nodules (top) and the the casts of the folded leather underneath the nodules (bottom); scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive, photos by A. Karnava).

Fig. 110. Complete flat-based nodules of two different sizes: large-sized **N18**, **N24**; small-sized **N48**, **N50**; scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive, photos by A. Karnava).

1.4 cm and an average height of 1.4 cm.[928] The folded documents had average dimensions of c. 2 × 1.1 cm.[929] The nodules with parallel string are of notably smaller size and secured equally small documents; they have an average length of 1.2 cm, average width of 1.5 cm and an average height of 1.2 cm. The folded documents measured c. 1 × 1.2 cm.[930]

The most remarkable difference is however that of the document dimensions. The first group of seals, those with the perpendicular string, sealed pieces of leather twice the length of those sealed by the second. This observation has direct repercussions regarding the size of the unfolded leather document itself, which was considerably larger in the former instance and smaller in the latter, and hence the amount of information it could carry would regularly vary.

One case stands apart among the small-sized sealings: sealing **N54** was stamped by a uniquely attested combination of two seals.[931] Although the nodule bears two seal impressions, it actually has a prismatic shape and could have accommodated three seal impressions. The shape of the nodule finds parallels among numerous Zakros specimens; it is described in *CMS* as *Vertikalscheibe, giebelförmig* and it is one of the cases when formal typology seems worth retaining.

As far as the dimensions of flat-based sealings found in Crete are concerned, Hallager calculated that the width of the folded leather imprint typically falls between 0.6 and 1.2 cm and its length between 1.0 and 1.5 cm. He observed that there existed also a small group with somewhat larger measurements, with a width between 1.2 and 1.8 cm and a length not less than 2 cm; these imprints are almost always found on one- and two-seal recumbent nodules with impressions from gold rings, quite often from the rings he designated as 'Knossian replica rings'.[932]

Different clay pastes: The division of the Akrotiri flat-based nodules into two distinct groups is further supported by the observations set out previously concerning the different clay pastes observed macroscopically. Clay Pastes A and B have a very similar appearance and are somehow connected through the fact that they were impressed by the same seal, the large ring with the bull-leaping scene.[933] Clay Paste B can be identified on one-seal nodules stamped by this ring, whereas Clay Paste A is attested among the two-seal specimens also stamped by the same ring.[934] It may be that the occasion when the ring administrator stamped single-handedly was altogether different, or took place at a different location from the one when this individual stamped documents jointly with any of the other seal bearers. The difference could be understood in that a variant source of clay paste had to be used.

928 The averages drawn from complete specimens: the lengths vary between 1.95 and 3 cm (23 specimens), the widths between 1 and 2 cm (21 specimens) and the heights vary between 0.95 and 1.8 cm (21 specimens).

929 The averages drawn from complete specimens: the lengths vary between 1.2 and 2.6 cm (18 specimens), and the widths between 0.85 and 1.9 cm (17 specimens).

930 The averages drawn from complete specimens: the lengths vary between 0.8 and 1.35 cm (8 specimens), and the widths between 0.9 and 1.4 cm (6 specimens).

931 *CMS* V Suppl. 3 nos. 396 and 397.

932 Hallager 1996, 143.

933 *CMS* V Suppl. 3 no. 392.

934 Two instances in which *CMS* V Suppl. 3 no. 392 is attested on nodules of Clay Paste A, which are listed under one-seal specimens, are too fragmentary to disprove the observation, since these could have been two-seal nodules.

But as far as Clay Pastes A/B *vs.* Clay Paste C are concerned, there are no seals attested in common. The conspicuous differences in clay qualities then (A/B *vs.* C), are accompanied by the exclusive use of certain seals.

The picture that emerges is that there were two distinct groups of nodules within the hoard retrieved in Room D18b, which, for the sake of convenience, will be dubbed 'Group 1' and 'Group 2' (*Fig. 111*). The groups are distinguished based on the following criteria in combination: the particular methods of manufacture that were employed regularly and consistently (*Fig. 109*); the size of the nodules, which accommodated seal impressions of different sizes and leather pieces of significantly different sizes (*Fig. 110*); and the different clay pastes used for the nodules (*Fig. 107*). Lastly, and more importantly, the two groups have no seal impressions in common. The numerous common characteristics of the nodules in each group separate them beyond any doubt. Nonetheless, it needs to be stressed that by no means do these groups represent 'types' or 'classes' of flat-based nodules: their interpretation is to be sought beyond typology. Furthermore, they do not represent provenance either, since more than one category of clay paste is accommodated under 'Group 1'.

The 'Group 1' seals stamped the large-sized sealings and reflect the activity of four different seals that produced 42 sealings. The small-sized sealings make up 'Group 2'; these were stamped by seven different seals, which produced 16 sealings. But the significance of this pattern is difficult to understand, if we include the fact that some seals from both groups were seemingly more 'active' and 'productive' than others. In an archival deposit we miss the temporal dimension in which the documents had been collected, an essential parameter for understanding this phenomenon.[935]

In both groups there is, however, a stamping pattern that is common: that of certain seals stamping sealings together with alternate 'seal-partners', therefore administrators collaborating with alternate administrators. Out of the 11 seals that are divided between the two groups, three seals had been active with more than one 'seal-partner': two of these seals had been active in 'Group 1'[936] and one in 'Group 2'[937]. Even though we do not yet understand what these 'groups' among the Akrotiri flat-based nodules represented, it seems certain that the stamping patterns observed were not random.

'First Rank'/'Dominant' *vs.* 'Second Rank'/'Subordinate' Administrators

The most interesting phenomenon among the Akrotiri document sealings does not, however, solely concern these different combinations of stamping partners. Rather it is the fact that one seal, specifically the large gold ring with the bull-leaping scene[938] — the constant partner in two different pairs of administrators — also stamped a series of

935 The notion of an 'intensive' seal use pattern introduced by Weingarten (1988, 11–14; 1990a, 107–12; Dionisio *et al.* 2014, 124), if valid, is impossible to relate to the present circumstances. The matter was also discussed in Chapter 2, p. 151.

936 *CMS* V Suppl. 3 nos. 392, 393.

937 *CMS* V Suppl. 3 no. 396.

938 *CMS* V Suppl. 3 no. 392.

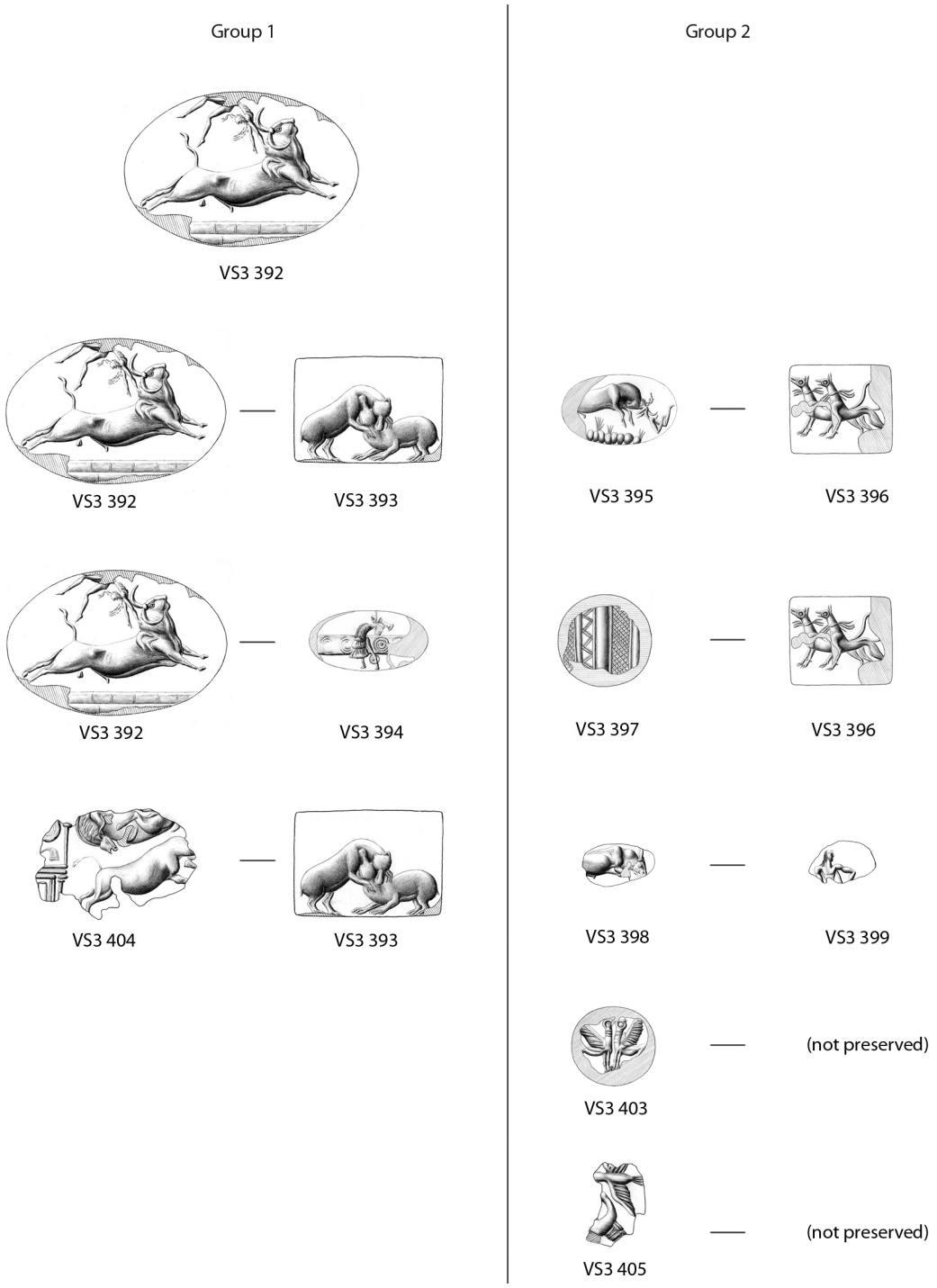


Fig. 111. Two groups of flat-based nodules and their respective seal impressions: 'Group 1' (*CMS* V Suppl. 3 no. 392 used single-handedly and in two different pairs; V Suppl. 3 no. 393 used in two different pairs; V Suppl. 3 nos. 394, 404); 'Group 2' (V Suppl. 3 no. 396 used in two different pairs; V Suppl. 3 nos. 395, 397, 398, 399, 403, 405); scale: 1:1 (*CMS* Archive).

documents without the collaboration of a second seal, i.e. the administrator with this ring also stamped single-handedly (*Figs. 108, 111*).

This undeniable fact is of major importance because it disproves a widely-held theory, namely, that two different systems existed within Neopalatial administration. In her attempt to define subtypes of flat-based nodules, Weingarten introduced the terms 'Single-Sealing-System' ('SSS') and 'Multiple-Sealing-System' ('MSS') to differentiate between one-seal and two-seal nodules (also three-seal nodules at Zakros, which are otherwise absent from the Theran material).[939] She suggested that the number of impressions on the nodules shows 'two quite different systems and, possibly, two different functions'. She also observed that no seal types overlapped in the two 'systems', which she considered to be a non-accidental fact.[940] Hallager, in turn, claimed that the types into which he divided the flat-based nodules were also real in the Minoan world.[941] He noted the exclusive use of certain seals on the different types he devised for flat-based nodules: rarely was a seal used for three-seal nodules found on two-seal or -seal nodules. In a similar line of thinking to Weingarten, he further suggested that the overlap of seal impressions between his 'standing' and 'recumbent' flat-based nodule categories was also rare and thus exceptional.[942]

The Akrotiri nodules, however, bear witness to the fact that overlaps do exist between one-seal and two-seal flat-based nodules: the 'bull-leaping' ring is found equally on one-seal and two-seal specimens. Moreover this is not an isolated exception; rather it can also be observed among flat-based nodules at Agia Triada[943] and Zakros (*Figs. 112, 113*).[944] Thus the occurrences cannot be considered accidental, but instead demonstrate that certain seals apparently had the administrative duty to stamp a sealing both on their own as well as together with another seal/administrator.[945] Now that all known Neopalatial sealings are presented in a uniform manner in the *CMS* volumes, we can see that certain seals were used in both Weingarten's sealing systems, the SSS and the MSS. Therefore, we can no longer speak of two separate systems.

The evidence from Akrotiri, supplemented by relevant evidence from Agia Triada and Zakros (and also Sklavokambos, see further below) demonstrates two vital facts. The first fact is that there existed an administrator who stamped on his/her own, and also jointly with other supplemental administrators. The second fact is that no evidence exists for these

939 Weingarten 1983b, 7–24; also described in Hallager 1996, 205.

940 Weingarten 1983b, 7, 103: 'the divide between MSS and SSS is all but absolute, implying that it is based on some absolute distinction'.

941 Hallager 1996, 150–51.

942 Doumas (2000b, 59) also follows Hallager in considering one-seal specimens as 'exceptional': he sees the Akrotiri sealings with two different seal impressions as a 'rule' and the ones with a single seal impression as an 'exception'.

943 *CMS* II,6 no. 15 stamps single-handedly, but also together with II,6 no. 4; II,6 no. 82 stamps single-handedly, but also together with II,6 no. 121; II,6 no. 19 stamps single-handedly, but also together with II,6 no. 41; II,6 no. 89 stamps single-handedly, but also together with II,6 no. 55.

944 *CMS* II,7 no. 7 stamps single-handedly, but also together with II,7 no. 11; II,7 no. 99 stamps single-handedly, but also together with II,7 no. 11, then together with II,7 no. 31 and then together with II,7 no. 81; II,7 no. 15 stamps single-handedly, but also together with II,7 no. 64; II,7 no. 33 stamps single-handedly, but also together with II,7 no. 41, then together with II,7 no. 51; II,7 no. 70 stamps single-handedly, but also together with II,7 no. 244; II,7 no. 110 stamps single-handedly, but also together with II,7 no. 116.

945 The phenomenon is further explored in Karnava – Blakolmer in preparation. A detailed account of all the relevant instances falls outside the scope of this monograph.

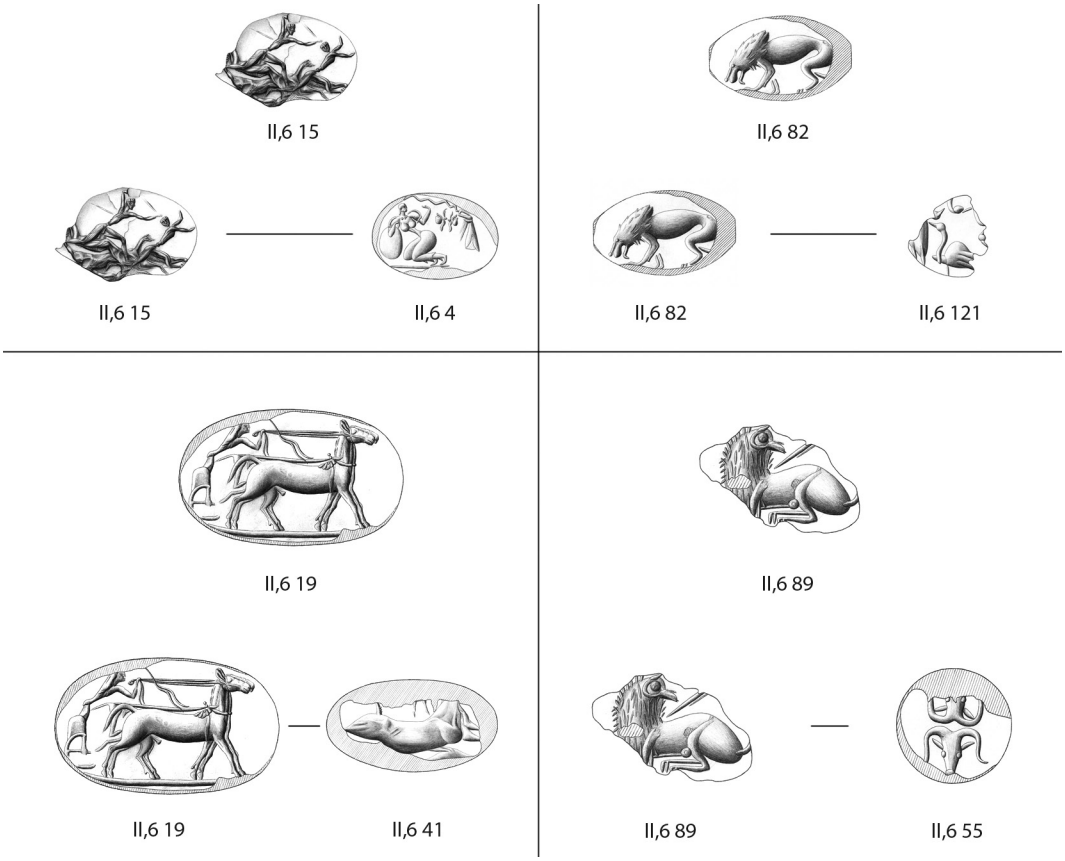


Fig. 112. Agia Triada pairs of administrators: 'first rank' administrators *CMS* II,6 nos. 15, 19, 82 and 89 stamped together with 'second rank' administrators II, 6 nos. 4, 41, 121 and 55 respectively); scale: 1:1 (*CMS* Archive).

supplemental administrators ever stamping anything single-handedly; instead they always stamp in conjunction with an administrator who could also stamp on his/her own. Both these phenomena can be observed without exception among the material from Akrotiri, Agia Triada and Zakros.

It seems, therefore, that there was at least one administrator, who had been active in preparing the Akrotiri flat-based nodules and had apparently possessed the authority to stamp sealings both on his/her own, as well as jointly with other, supplemental administrators. At present, the sole explanation that can be proposed for this phenomenon is that some administrators had greater authority than others, since they could act independently and without need for further verification from other administrators. If the stamping of a nodule served to verify or authenticate the transaction recorded on a leather document, it may be assumed that the administrator whose unassisted authentication was sufficient was a higher-ranking official than the one who never stamped alone but always functioned in a supplementary manner. If alternative explanations are to be sought, they would have to account for both these phenomena: the unassisted, single-handed stamping, as well as

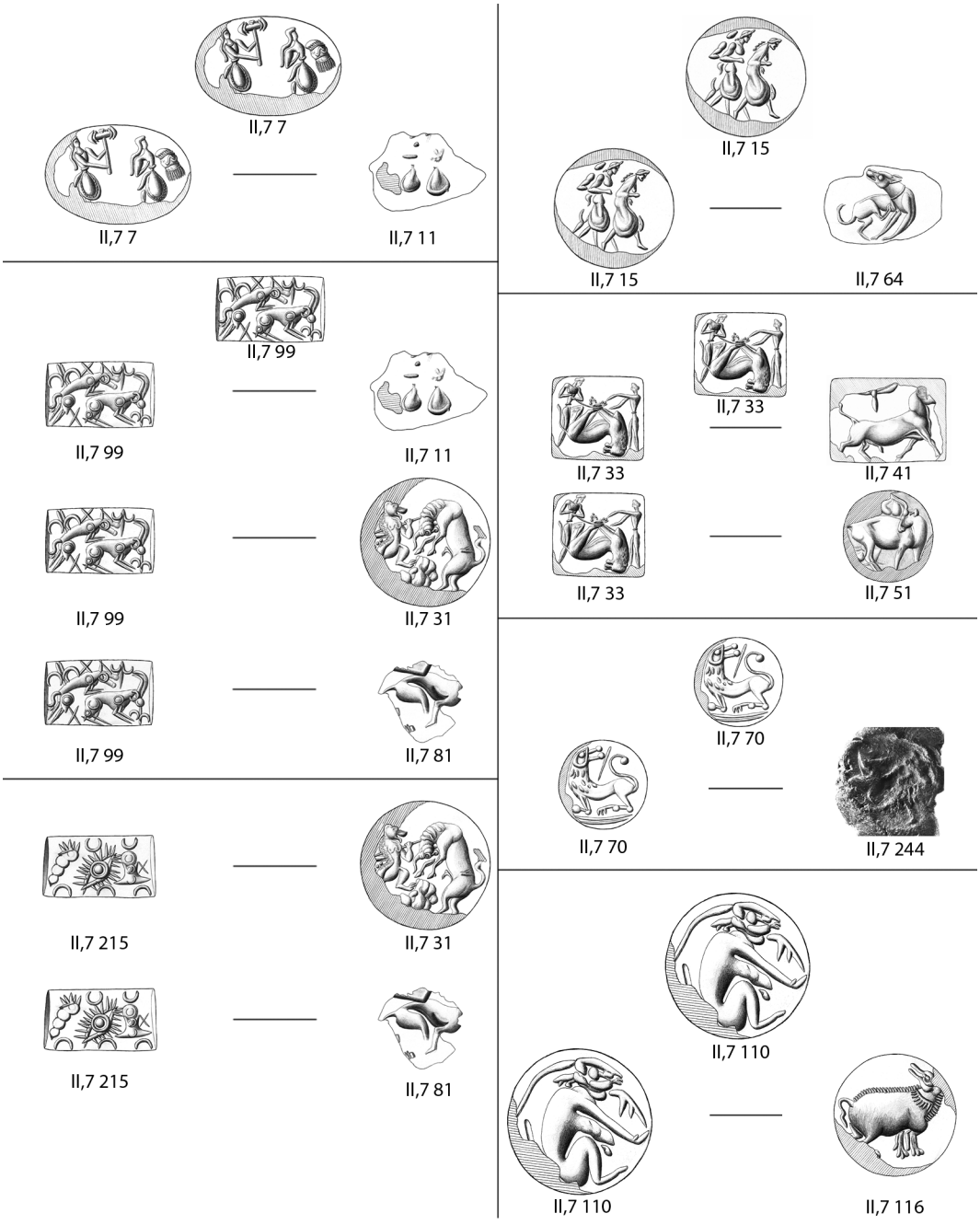


Fig. 113. Zakros pairs of administrators: 'first rank' administrators *CMS* II,7 nos. 7, 15, 70 and 110 stamped together with 'second rank' administrators II,7 nos. 11, 64, 244 and 116 respectively; 'first rank' *CMS* II,7 no. 33 stamped together with two 'second rank' administrators II,7 nos. 41 and 51; 'first rank' *CMS* II,7 no. 99 stamped together with three 'second rank' administrators II,7 nos. 11, 31 and 81. Since 'second rank' administrators *CMS* II,7 nos. 31 and 81 stamped also with II,7 no. 215, we assume that II,7 no. 215 is also a 'first rank' administrator, although no single-handed impressions of this seal are found; scale: 1:1 (*CMS* Archive).

the supplemented stamping, all attested among the Akrotiri, Agia Triada and Zakros flat-based nodules.

From the flat-based stamping patterns on these sites, the picture of a hierarchy of seals and therefore of administrators behind them emerges. We can call the administrator that apparently had a higher degree of responsibilities and authority a 'first rank' or 'dominant' administrator, and the ones that appear to have had less authority 'second rank' or 'subordinate' administrators (*Fig. 114*).[946] It could be that there were even more 'ranks' or degrees of administrative responsibilities lurking behind flat-based stamping patterns, but the 'ranks' currently attributed to these administrators refer to a hierarchical behaviour they exhibit in relation to one another.

It needs to be stressed that this hierarchy of administrative duties can only be detected among sealings of 'Group 1'. Although the phenomenon of alternate stamping partners exists among sealings of 'Group 2', no seal/administrator appears to have stamped anything on his/her own. If a hierarchy did prevail among the seals/administrators that produced the sealings of 'Group 2', it cannot be detected among the evidence to hand.

More 'Dominant' Administrators: An Emerging Model of Administrative Hierarchy

This hierarchy of administrative duties that emerges among the sealings of 'Group 1' has still more to it. So far it has been suggested that an administrator qualifies as 'first rank' if (s)he can stamp both single-handedly and in collaboration with those administrators defined as 'second rank' or 'subordinate' (*Fig. 114*). But this hierarchical arrangement can be taken a step further based on the observation that 'second rank'/'subordinate' administrators appear to stamp two-seal flat-based nodules only as supplemental forces to a 'first rank'/'dominant' administrator. In this respect, one of the previously-defined 'second rank'/'subordinate' administrators can be seen to join forces with yet another stamping partner, *CMS* V Suppl. 3 no. 404 (*Figs. 108, 111*). Although *CMS* V Suppl. 3 no. 404 did not stamp any of the Akrotiri sealings single-handedly, one can suggest that this seal/administrator also qualifies as a 'first rank'/'dominant' administrator, since (s)he collaborates with a 'second rank'/'subordinate' administrator. In a well-organized and strictly repetitive administrative system, such as the one we are seeing here, we have to assume that each administrator had specific and fixed duties, which would be repeatedly reflected in stamping patterns.

Through these intermingling stamping pairs we can isolate four seals, two of which qualify as 'first rank'/'dominant' administrators and two that qualify as 'second rank'/'subordinate' administrators (*Fig. 115*). One cannot fail to notice that both 'first rank'/'dominant' administrators had seals that were, in all probability, sizeable gold signet rings, a matter to be addressed further on.

And then comes the obvious question: can we place the administrator with the chariot ring inside this hierarchical system of administrative actions? The question is all the more important, since this ring is known to have stamped sealings found not only at Akrotiri,

946 Not to be confused with the characterization 'sealing leader', which defines 'those who used their seals most often' (Weingarten 2010b, 323).

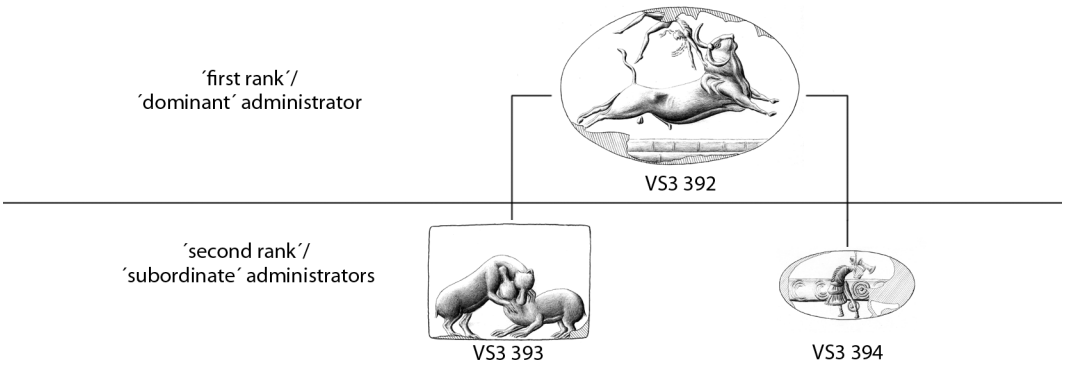


Fig. 114. A 'first rank'/'dominant' administrator *CMS* V Suppl. 3 no. 392, and his/her collaborators, 'second rank'/'subordinate' administrators V Suppl. 3 nos. 393, 394; scale: 1:1 (*CMS* Archive).

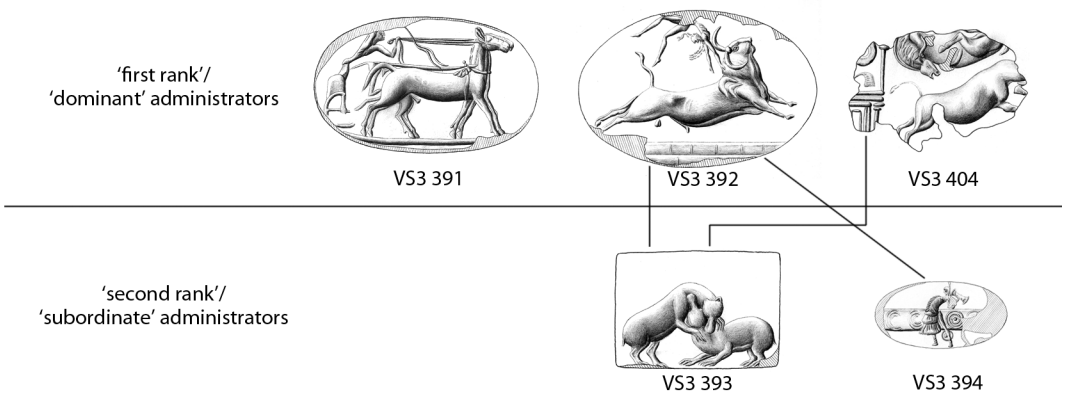


Fig. 115. Three 'first rank'/'dominant' administrators *CMS* V Suppl. 3 nos. 391, 392 and 404 and two 'second rank'/'subordinate' administrators V Suppl. 3 nos. 393, 394 among the Akrotiri flat-based nodules; scale: 1:1 (*CMS* Archive).

but also at Agia Triada, as well as Sklavokambos, after some generations had elapsed (*Fig. 106*). This unique instance in the Aegean of a seal having been used at distant time periods is inexplicable. The use of an older seal could point to matters of legitimacy of authority, which would be dealt with through the evocation of a recognized and respected symbol of a glorious past.[947] The ring with the chariot scene is attested on three specimens at Akrotiri, in each case being the only seal used, but the evidence from Agia Triada and Sklavokambos shows a more interesting picture. On five flat-based nodules, the chariot ring was used

947 Such interpretation has been offered for the use of older seals attested in the archives of Alalaḫ Level IV dating to the 15th and 14th centuries BC, whereby certain kings made use of seals of an ancestor or a predecessor (Postgate 2013, 385–86).

alone;[948] but in one unique instance at Agia Triada it is joined by a second seal and together they stamp a sealing (*Fig. 112*).[949]

Thus, while the ring with the chariot scene stamps single-handedly at Akrotiri, evidence from Agia Triada demonstrates that the individual using this ring behaves like a 'first rank'/'dominant' administrator. As previously described, the Akrotiri evidence points to the co-existence in the same archival deposit of two 'first rank'/'dominant' administrators, who collaborated with 'second rank'/'subordinate' administrators. This does not, of course, preclude the existence of a third 'first rank'/'dominant' administrator. But because the relevant evidence at Akrotiri and the Cretan sites comes from archival deposits separated by a considerable time span, differences could also be explained by developments in the adminstrative system over time. Neverthess, it is suggested here that the ring with the chariot scene should also be inserted in this hierarchical system of administrative actions (*Fig. 115*). The ring should probably join 'Group 1', since it is this group of sealings that exhibits a hierarchical structure.

THE POTENTIAL IMPORTANCE OF SEALS AS STAMPING AGENTS

In light of the previous discussion and the designation of certain seals as more important and higher ranking than others represented among the Akrotiri sealings, the question arises as to the nature of the seals used within the framework of this administrative hierarchy. How important, meaningful and/or distinctive were the size, the shape, the material, or even the motif of a particular seal?[950] Were the seals meaningful in their own right, i.e. does the choice of a seal or its attribution to a specific administrator reflect differences in socio-political status or administrative responsibilities?

The question can be tackled both with regard to the administrative scheme identified in the two groups of flat-based nodules, as well as with regard to the administrative hierarchy that emerged from the study of the Akrotiri flat-based nodules.

The Size of Seals and Seal Faces

Size seems to be a constant differentiating factor between the seal faces impressed in the two groups, but not always one among the seal faces of each group (*Fig. 111*). Thus the size of the large ring bezels of 'Group 1' appears imposing when compared to their more modest partners, but size among the pairs of seals in 'Group 2' does not vary significantly. It is probably no accident that differences in the size of seal faces are more evident in 'Group 1', where an administrative hierarchy between seal users has been suggested. It seems that the 'first rank'/'dominant' administrators made use of larger seals than the 'second rank'/'subordinate' administrators.

948 *CMS* II,6 no. 19 (HMs 591, Agia Triada); II,6 no. 260 (HMs 632–635, Sklavokambos).
949 On the two-seal flat-based nodule HMs 516, where *CMS* II,6 no. 19 stamped jointly with II,6 no. 41.
950 The relevant question posed for the Mycenaean period (Flouda 2010).

In 'Group 1' the 'first rank'/'dominant' administrators made use of metallic rings, which were probably gold, as are the majority of surviving Neopalatial rings.[951] These imposing rings stand in stark contrast to the hard stone cushion and the smaller-sized metal ring that were used by the 'second rank'/'subordinate' administrators. Notwithstanding doubts as to whether they ever served as true finger rings, owing to their small hoops,[952] they would certainly have made a more striking impression than those used/carried by the 'second rank'/'subordinate' administrators. These large gold rings could, therefore, have served a dual purpose: to demonstrate at a glance the status as 'first rank'/'dominant' administrator of their bearer; and to verify, through the large size of the impression, the administrative status of the person who had been involved in stamping, even when the seal or the seal bearer was no longer present.

Regarding the relationship between the two groups of sealings, we may observe that in 'Group 1' one of the 'second rank'/'subordinate' administrator seals corresponds exactly in size to a seal in one of the pairs of 'Group 2'.[953] This could be used to link the two groups in a further hierarchical chain, but there is simply no way of telling whether this had been the case.

The Shape of Seal Faces and the Seal Materials

At first glance, among the seals used in both groups, we see a predominance of oval-shaped metal faces,[954] and fewer round faces from hard stone seals.[955] The majority of oval-faced seals can be explained by the fact that most seals used for stamping the Akrotiri sealings were metal rings, probably of gold.

In at least three cases, some of these seals with oval and round faces are combined with hard stone cushions with rectangular faces; this applies in both groups.[956] If there is, however, a rule to be seen here, it is immediately disproven by a small-sized ring with oval face used by a 'second rank'/'subordinate' administrator, which accompanied an oval-faced seal of a 'first rank'/'dominant' administrator; this ring does come out in any case as a relative 'anomaly' in the neat and homogeneous pairs of seals and administrators of both groups on account of its theme (a cultic scene) and its manufacturing material (metal) (*Fig. 111*).[957] A note is reserved here with regard to the typology devised in the latest *CMS* volumes for subtypes of flat-based nodules:[958] the two-seal flat-based nodules stamped by gold rings with oval faces in combination with cushions all belong to Müller's *Vertikalscheibe, giebelförmige Variante* (gable-shaped/'standing' flat-based nodules), whereas the few flat-

951 Krzyszkowska 2005a, 127.

952 Krzyszkowska 2005a, 128–30. An interesting discussion also in Müller 2005a.

953 *CMS* V Suppl. 3 no. 394 of 'Group 1' and V Suppl. 3 no. 395 of 'Group 2', both of which measured 1.1 × 1.8 cm.

954 *CMS* V Suppl. 3 nos. 391, 392, 394, 395, 400, 404. The seal used on the unique one-hole hanging nodule also had an oval face (*CMS* V Suppl. 3 no. 401).

955 *CMS* V Suppl. 3 nos. 397, 403. The seal used for the unique direct sealing also had a round face (*CMS* V Suppl. 3 no. 402).

956 *CMS* V Suppl. 3 nos. 393 and 396, both used in two different pairs. The phenomenon is discussed in Dionisio *et al.* 2014, 124–25, where no hierarchical relationship is discerned between collaborating seals.

957 *CMS* V Suppl. 3 no. 394. See below, pp. 212–13, 218–19.

958 See Chapter 2, pp. 105–06; *CMS* II,7 pp. 272, 274, table 1; *CMS* II,6 pp. 349–60, 395, table 4.

based nodules stamped by the large gold ring in combination with the small gold ring, both with oval faces, belong to the subtype *Horizontalscheibe mit zweitem Abdruck* ('recumbent' flat-based nodule with two seal impressions).[959]

In any case, in most impressions neither the shape of the original seal face nor the material from which it was made are clearly discernible: consequently shapes and materials would hardly have made any difference once stamping had occurred. If any significance can be posited for the shape of seal or seal face, or even for the material from which it was made, this would only apply when the person carrying/using the seal was still present.

The Seal Motifs

The more vexing question is whether the motif, the theme of a seal's decoration and/or its complexity, was meaningful in some way. The question can work both ways, especially for the seals defined as belonging to 'first rank'/'dominant' administrators: were these administrators awarded motif-specific administrative insignia, or were they at liberty to use seals with motifs of their choosing? Were some motifs more important than others? Among the seal impressions termed here as 'first rank'/'dominant' administrators there is a chariot scene, a bull-leaping scene, and a fragmentary scene involving two bovines and a building (*Fig. 115*).

The importance of bull-related imagery and especially the efforts to connect it to Knossos and a presumed Knossian Neopalatial hegemony are almost commonplace in the literature.[960] There appears, however, to be a logical gap in the reasoning which claims that the bull symbolized the might of Knossos: what are we to make of the many other scenes depicted, in which no bulls at all appear? Assuming that the image of the bull represented the authority of Knossos, we are still left with the question what were other 'first rank'/'dominant' seal images supposed to stand for. Could they convey a message independently and regardless of their co-existence with bull-related images? Another problem with assigning a special importance to bull-related images is that a significant proportion of the seals attested on the Akrotiri sealings is bull-related anyway, to such an extent that it is not clear how the bull-related imagery stood out, if at all.

A common element among 'first rank'/'dominant' seal images appears to have been their narrative character. These motifs tell a story and represent an event which demonstrated a person's capacity to excel in an activity such as chariot-driving or bull-leaping,[961] or depict a scene combining standard narrative elements, for instance the theme of two bovines and that of a building. Yet this narrative character of 'first rank'/'dominant' seal motifs is not absent in the seals of 'second rank'/'subordinate' administrators either: the

959 A nodule of the same subtype is the two-seal flat-based nodule from Agia Triada HMs 516, stamped by the large golden ring with the chariot scene *CMS* II,6 no. 19 (the same as the one that stamped the Akrotiri specimens), jointly with II,6 no. 41 (a medium-sized gold ring, measuring 2.3 × 1.6 cm, with a bull-leaping scene). Whether there is some connection between the types of seals used by 'second rank'/'subordinate' administrators (whether cushions or metallic rings) and the subtypes of flat-based nodules defined and described in the *CMS* remains to be seen in future investigations.

960 Betts 1967, 25–27; Hallager 1996, 209; Hallager – Hallager 1995.

961 Doumas wondered whether any such specific motif was meant to stand as a symbol for some capacity of the owner (the case of bull-leaping, chariot racing, etc.), and pondered whether the sealing certified championship in any of these games (Doumas 2000b, 63–65).

cultic scene with the part of a procession appears no less narrative in character than the seals of 'first rank'/'dominant' administrators.[962]

Earlier discussions on the role of specific iconographic choices on seal faces include notions of the popularity of motifs, their possible religious significance, or being symbolic of 'the personal insignia of an individual ruler or lesser official, even of a dynasty or group of officials'.[963] Alternative explanations concern the establishment of a 'royal' iconographic vocabulary by LM IA in the Knossian palatial workshops, which was passed on in standardized versions to all categories of artistic expression, with relief wall paintings seen as being at the forefront of innovations that directed trends towards the small-scale figurative craftsmanship. This interconnected system functioned collectively as a visual mechanism for propaganda and small-scale representations, such as the ones attested in seal imagery, are thought to have served as long-distance carriers of the prototypes.[964]

Some preliminary, generic thoughts on the overall imagery found on the Akrotiri sealings stressed its insistence on the human environment and its activities, as opposed to abstract, natural and probably more 'neutral' themes.[965] The scenes chosen as themes for the seals that stamped the Akrotiri sealings conveyed messages of power, competitiveness and aggression; these messages were not aimed specifically at Akrotiri and/or Thera, but were nevertheless recurrent in Minoan Crete during the Neopalatial period.

962 See above, p. 211, and below, pp. 218–19.
963 Betts 1967, 22.
964 Blakolmer 2007, 42–43.
965 Georma *et al.* 2014. An interesting take also in Shapland 2010b.

CONCLUDING REMARKS

The overwhelming majority of the objects retrieved at the Cycladic settlement of Akrotiri in Thera and discussed in this book are known to have been brought in from the neighbouring island of Crete. A question that underlies their study is the 'indexical' role Cretan seals and sealings can be understood as having had at Akrotiri, whereby 'an "index" in Peircean semiotics is a "natural sign", that is, an entity from which the observer can make a *causal inference* of some kind, or an inference about the intentions or capabilities of another person.'[966] In anthropological terms, with the transfer of these objects from Crete to Thera one is forced to wonder about what has colourfully been described as 'the abduction of agency':[967] what inferences exactly the people who received seals and sealings at Akrotiri formulated about the social, i.e. political and financial, meaning of these agents in their place of origin?

The query has multiple strands: it starts with what was intended by their manufacture and shipment in the first place; whether they were even made at all for the purpose of being sent to Akrotiri; how they were perceived in their place of reception (i.e. their original affordances); and finally, whether or not the initial goal(s) was (were) achieved. All the previous questions apply differently in the case of seals, stamped sealings and stamped objects.

THE INFORMATION WE ARE MISSING

Regarding the 'indexical' role of sealings matters are particularly complicated, since we are not certain whether it was the sealing itself or the seal impression(s) it bore that functioned as the sign conveying the message. In addition, more than one agent lurked behind them: they were stamped by a person in an official capacity, who was acting however on behalf/in the name of an even higher authority. The matter of personification of official responsibility[968] adds yet another level of complexity to the reception of these items: depending on how personalized or impersonal the system had become, how are we to know what the receivers recognized behind the sealings? Was it an eponymous individual or a specific office? Incidentally, all the above questions apply quite differently depending on who was at the receiving end: we cannot deny that people who received the sealings at Akrotiri were knowledgeable about their meaning and importance, but there is no way of telling whether these people belonged to the local population or came from Crete themselves.

The sealings were produced because of a unidirectional, consecutive series of established conventions. The process would emanate from a high authority, invisible in the archaeological record, whose representatives were the seal bearers, people of a certain status in the administration. How exactly authority was delegated from the upper echelon to the seal bearers cannot be ascertained, but it seems that the seals functioned as the insignia of this

966 Gell 1998, 13.
967 Gell 1998, 13–16.
968 See Chapter 4, p. 199.

delegated power. The responsibilities these people undertook were evidenced through the seals, and subsequently through the seal impressions and the sealings they were meant to produce. The initial medium of the delegated authority, the seal, would move in to create yet a further medium, the sealing, without which the person(s) at the start of the process would not have been able to transmit their message.[969] In the case of the sealings that sealed leather documents it appears that the message conveyed through these documents was in need of authentication through stamping; whether the leather documents could ever function at the receiving end without their authenticating stamps is not clear. That these sealings were kept in order to form archival deposits with or without the leather documents they accompanied, shows that the seal impressions and the physical entity they created, the sealings themselves, were an integral part of the message to be conveyed. Between the higher authority, therefore, and the receivers of their messages a chain of media, people and things alike, functioned as conductors of the message: in order of appearance, these were the administrators, their seals, the leather documents and the sealings. They all became nodes in a network that comprised human and non-human entities, which functioned intermittently in active or passive manners.[970]

The temporal dimension is also of great importance and among the information sorely missed. We cannot assume that sealings at Akrotiri had *a priori* the same implications and substance for the local population, as those acquired in their place of origin, Crete, after centuries of continuously implemented administrative practices. In addition, the fact that in Crete they represented an administrative system designed and applied from within, whereas at Akrotiri they were, in all probability, a foreign body, is bound to have been of some significance. The distinct and circumscribed level on which the sealings functioned at Akrotiri is further emphasized by the likelihood that an altogether different and seemingly unrelated local accounting system was in place, one which made use of clay cylinders for counting.[971]

Admittedly, we cannot know how far back we should posit the import of Cretan sealings at Akrotiri, or whether we are seeing the first and last examples of such importations. Still the amount of time potentially involved in such processes is not a negligible factor. The unknown time span involved in the introduction of Cretan sealings at Akrotiri contrasts with the known time span derived from the seal data, with the earliest imported seal **S3** found at Akrotiri to be dated in the MC A period, corresponding to MM IA, i.e. c. 2100–1900 BC. The inhabitants of Akrotiri had long been acquainted with seals, a fact which establishes *de facto* different trajectories for the reception of Cretan seals and sealings at Akrotiri.

We are also missing all clues on the potential time span for the storage of sealings. Unlike Linear B tablet archives that are regarded as annual, or even monthly, records — an assumption based on references within the tablets themselves to registrations of 'this'

969 An instance where the seal and the sealing come together to form a new social reality, one that would not have existed without them (Latour 2000).

970 Knappett 2002, 114–15.

971 The clay cylinders from Room D17 are presented in Tzachili 2002–03; 2008; one more cylinder surfaced in Room D16, see Chapter 2, pp. 35, 38. A more recent examination sees them as tally-sticks (Firth 2016).

year and the 'debts' of 'last year'[972] — we are entirely missing all comparable evidence for sealings. A period of 15 years has been tentatively suggested for the Protopalatial sealing deposit in the palace of Phaistos corresponding to some 45 administrative cycles, but was met with fierce opposition.[973] Even with respect to Egyptian evidence, discussions have been similarly inconclusive as to how long the sealings that accompanied products or letters were kept and when they were discarded. Scholars have suggested a period of months or a year or two, but even a hundred years have been posited. A papyrus in the Louvre dating to the reign of Tutmose III (18th Dynasty) introduces the notion of an 'administrative cycle' which lasted between four and 21 months;[974] after this ended old and useless sealings would have been discarded. It needs, however, to be stressed that the aforementioned suggestions for the Protopalatial Aegean and New Kingdom Egypt involve primarily the so-called direct sealings, which have little if nothing to do with the Akrotiri evidence.

In the long list of information we are missing on the clay sealings, and despite all these agents intervening — seal bearers/administrators, seals, sealings and leather documents — we are in the dark as to the actual agency involved. We see the people and the objects they use as instruments of control engaged in an administrative process, but the process already appears fixed and settled because of its repetitiveness and regularity. The agents are nowhere to be seen as individuals or independent actors: certainly they all act, but within a framework of an established system, and according to what we assume are prearranged conventions. The notion of intentionality, which would be fundamental to discerning individuals behind the administrative structure, is here impossible to detect: we see the effect, but we are unable to see the motive or the cause behind the action. Possible social tensions, intended and unintended consequences, potential oppression or resistance to the system, all phenomena so often encountered in power structures, remain invisible in our case.[975] What can be ascertained is that through the actions of human individuals in the administrative chain the system was maintained and reproduced, thus affirming and strengthening social inequality inherent in hierarchical formations.

WHERE ARE THE WOMEN?

While we are missing the individual in this study, it seems that the next thing we are missing is gender, most notably the female one. This does not automatically mean that administration was left to male actors: we have evidence for neither gender. In the absence of texts — a fact which is ironic considering that the main topic in this monograph has been precisely written documents —, gender is particularly difficult to detect in archaeological evidence, and women even more so.

972 The Linear B evidence is scarce: Bennet 2001, 27–29; Palaima 2003, 169–72, suggests Linear B tablets in Pylos 'probably cover between two and five months of selected economic activities within a given administrative period'.

973 The suggestion in Weingarten 1994b, 290, the opposition in the responses by Poursat (297–98), Frangipane (300), Fiandra (300–01), and more recently, Relaki 2012, 304–05.

974 The information in Moeller – Marouard 2011, 107, n. 78.

975 Dornan 2002, 320, 324–25.

Some efforts to detect women through texts have been made for the Mycenaean period, when the Linear B texts in their usual telegraphic brevity have offered some clues. Women did not participate in the higher echelons of political power or land holding in Mycenaean society, but some did own and lease land, they did take up religious roles, and had distinct responsibilities in terms of production and the economy.[976] Eritha the priestess and Karpathia the keybearer, who probably controlled access to the resources of the Pylian sanctuary of Sphagianes, are the two most prominent female figures in the Pylian Linear B texts; a labour supervisor, Kessandra, oversees male workers and further distributes food rations.[977] Evidence dating to the Old Babylonian period from Sippar is more eloquent on the property rights of the female *nadītu* priestesses of Šamaš, who were clearly involved in the buying and leasing of land, as well as the control of wealth through loans.[978] Overall, texts from the ancient Near East make references to or are signed by some, rather few, female scribes, and there were some more women that could read and write; but the equally few women that had the right to possess and use their own seal were wives or daughters of kings or high officials, i.e. they belonged to high-ranking families.[979]

From the Egyptian Middle Kingdom only some scarabs are known to have belonged to female members of the family of Senwosret III, who appear to have been independently active in financial activities in the town of Wah-Sut in South Abydos, but never in the mortuary complex of the same king.[980] Women are known to have participated in public life and administration in Egypt from the Old Kingdom onwards, but it seems that their participation was limited and specific. There is some scanty evidence to suggest that it was even possible for women to be home-schooled in reading and writing.[981]

But the usual way to go about looking for gender in prehistory, when no texts are available or deciphered, is through iconography and burial customs, where men and women and more fluid social identities can be distinguished with more or less ease.[982] The sealings attested at Akrotiri contain a number of representations of humans, which all happen to be male. This fact can only be accidental, since female representations do exist in Minoan iconography, including wall paintings and sculpture in general, and women are visible in Minoan public life in a number of ways.

Apart from direct evidence such as that which could have been offered by iconography, there is minimal indirect evidence for any female involvement in any of the processes described in this study, i.e. administrative processes, importation and use of seals and sealings. A suggestion has been put forward on the basis of measurements of hoop diameters among surviving LBA signet rings that interprets their differing sizes as an indication that these rings were worn by both men and women, in which case the rings were obviously made to order.[983] Moreover, among the surviving signet rings there are some with

976 Eder 1994; Olsen 2014.
977 Shelmerdine 2016; 2017.
978 De Graef 2016.
979 Stol 2016, 367–71, 387–89.
980 Wegner 2004.
981 Grajetzki 2009.
982 Hitchcock – Nikolaidou 2013; Weingarten 2009.
983 Müller 2005a, 172–73, pl. XXXVIIj. The male earthquake victim at Anemospilia, however, allegedly wore a silver ring on the small finger of his left hand (Sakellarakis – Sapouna-Sakellarakis 1997, 294–95, 650–51, 692–94, fig. 717).

consistently small-sized hoops of a specific manufacturing technique (finger-bed plate; semi-globular hoop profile with transverse ribbing) that attest to cultic scenes; naturally, these rings have correspondigly small bezels.[984] Cultic scenes, although present, are not the majority among administratively active rings during the Neopalatial period, we need therefore to keep in mind that not all LBA signet rings were administrative rings. It would be tempting, however, to see a female administrator behind the 'second rank' ring with the cultic scene detected among the Akrotiri evidence (*Fig. 77*), since this would have been a ring that matched the observations made on the basis of the surviving examples.[985] The fact that a cultic scene is attested oddly echoes the Linear B textual evidence laid out previously, where priestesses are shown to have participated in legal and financial transactions.

THE SEALS AND THE IMPRESSED OBJECTS

The evidence for one use of certain seals as stamping agents is usually provided indirectly, namely through their impressions on clay. Seals **S1**–**S16** found at Akrotiri were not — to the best of our knowledge — used for stamping, since we are missing relevant evidence to support such an assumption. Furthermore, the administrative sealings **N1**–**N75** found so far at the site appear to have been stamped elsewhere and imported to the island as such. Lastly, among the extremely small number of seal impressions on objects, represented by **I1**–**I3**, only one was locally manufactured while the other two are of uncertain origin. All this is evidence that leaves us with a very thin case for locally-practised stamping habits.[986]

A certain suspicion regarding the possible use of the Akrotiri seals for stamping, though not necessarily of clay,[987] arises from the extensive wear on some examples. The engraved faces of lentoids **S2** and **S9** appear in a bad state of preservation, but their overall state of preservation is bad; then, the engraved face of lentoid **S6** is completely effaced, whereas its non-engraved face seems to be in a good state of preservation. Assuming that this were to be considered as evidence in favour of use wear under normal circumstances, it has to be stressed that Akrotiri reserves unpredictable preservation conditions for each and every material buried under the pumice. The *Petschaft* **S15** is also worn, but it is made of a soft, calcareous material, a mineral that has proven sensitive to the particular taphonomic conditions at Akrotiri and was therefore subject to surface corrosion.

A further use that could be suggested for seals during the Neopalatial period is that of personal adornment.[988] There are two instances of seals appearing on wall paintings: the well-known Cup Bearer Fresco at Knossos, which has long provided evidence that seals were worn on the wrist (*Fig. 116*);[989] and the bull-leaper from Tell El-Dab'a (Avaris)

984 Measured on the rings with finger-bed plate and semi-globular hoop profile in Müller 2005a, table 1, pl. XXXIV, XXXV: their bezel lengths vary between 1.5 and 2.45 cm.

985 *CMS* V Suppl. 3 no. 394 came from a bezel of 1.8 cm length. See Chapter 4, pp. 211–13. A note of caution is due, in that the surviving rings come from LM/LH II onwards contexts (for instance, see Becker 2011–12, 82–83, who discusses one of these rings, namely *CMS* I no. 129).

986 See also, Karnava 2008; 2016a.

987 Ethnographic and archaeological parallels frequently feature textiles, bread and the human body as candidates for receiving seal/stamp impressions.

988 For the matter, among other interpretations, Younger 1977; subsequently, Pini 1998; Müller 2005a.

989 Evans 1928b, 704–12, fig. 441.

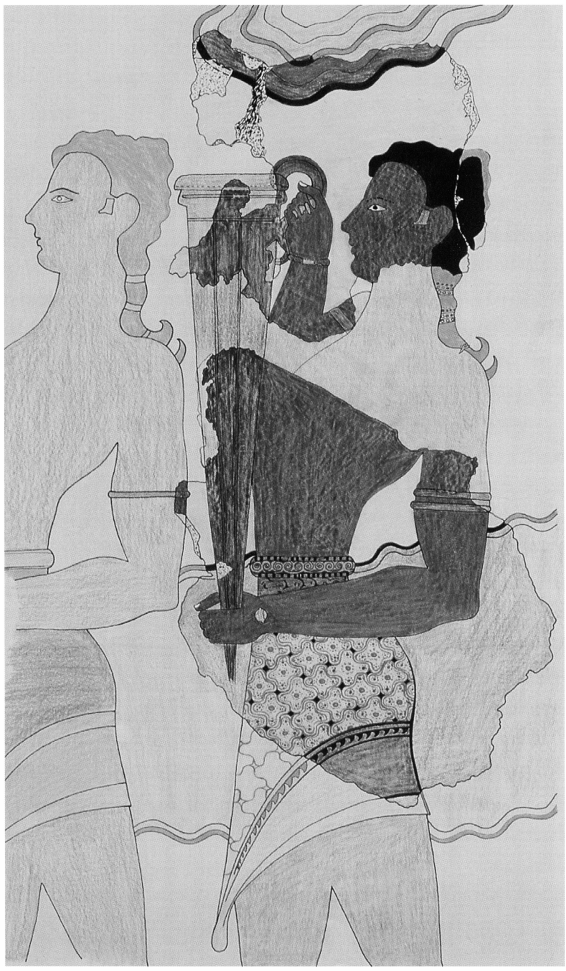


Fig. 116. Knossos: reconstruction of a wall painting fragment, depicting a man who participates in a procession wearing a seal around his wrist (Evans 1928a, pl. XII).

in Egypt, who also wears a seal on his wrist (*Fig. 117*).[990] In these examples, however, the figures do not appear to be engaged in everyday activities: the Cup Bearer was taking part in some kind of formal procession, while the bull-leaper was participating in a ceremonial game, which was probably held on special occasions. It is noteworthy that the Cup Bearer seemingly wears a lentoid, the most common Neopalatial shape, whereas the Avaris bull-leaper wears a cushion. It has been suggested that cushions were fairly prominent among administratively active seals at the transition from the MM III to LM I, but nothing can be said regarding the previous or succeeding periods.[991]

The numerous wall paintings found at Akrotiri afford no evidence as to the wearing of seals, which should make us hesitate in automatically regarding any seal found on the site

990 Bietak *et al.* 2007, 80.

991 Dionisio *et al.* 2014, 121–25. Apparently the person interpreted as a priest in Anemospilia appears to have worn a cushion in his left wrist (Sakellarakis – Sapouna-Sakellarakis 1997, 294–95, 650–51, 692–94, fig. 717).

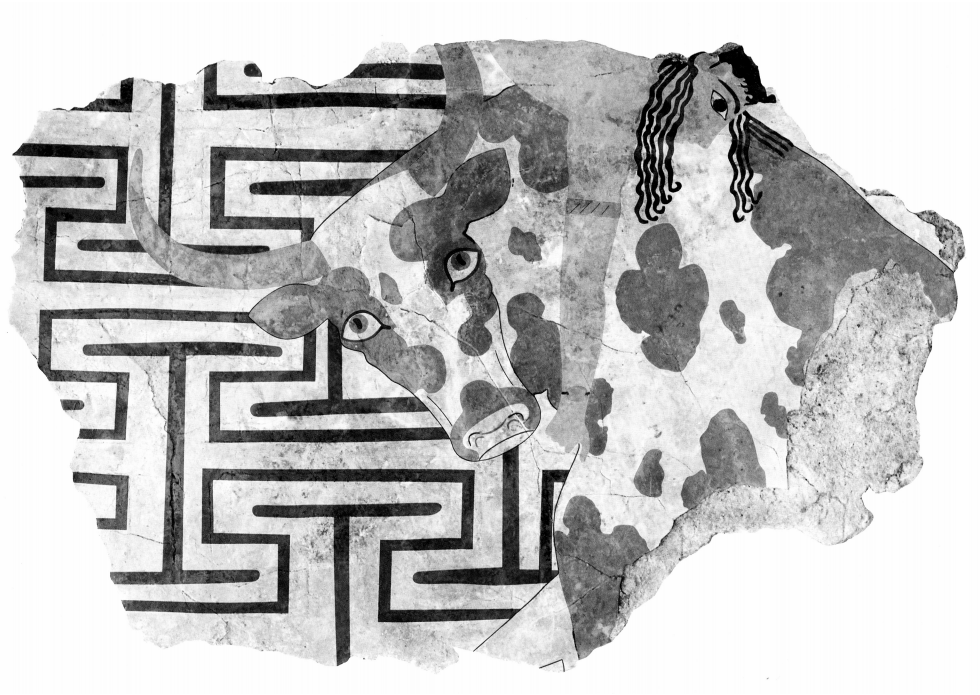


Fig. 117. Tell El-Dab'a (Avaris): reconstruction of a wall painting fragment, depicting a bull-leaper wearing a seal around his wrist (Bietak *et al.* 2007, 95 no. A13; image courtesy of the authors and the *Verlag der Österreichischen Akademie der Wissenschaften*).

as jewellery.[992] Furthermore, none of the Akrotiri seals has been found in contexts containing beads or items from necklaces and bracelets.[993] A single sketch of a bull-leaper is attested behind a wall painting in Xeste 4,[994] but the representation does not provide much detail. A procession scene in Xeste 4 depicts men impressively stripped of jewellery and footwear.[995] A scene in Xeste 3 shows men carrying vessels and a piece of cloth, evidently involved in a ceremony where liquid was poured.[996] But none of the figures on the Akrotiri wall paintings, whether male or female, is shown wearing a seal. To be sure, women wear an impressive amount and a variety of jewellery,[997] some of which even seems to be standardized, such as hoop earrings and bracelets, but none contains seals. The complete absence of seals as personal jewellery among the individuals depicted on Theran wall paintings[998] can be explained in so many ways that it is hardly worth discussing them. One need only think of the different uses reserved for seals in Knossos, Tell El-Dab'a and Akrotiri; it is also possible that the excavations at Akrotiri have simply not revealed the relevant evidence yet.

992 *Pace*: Vlachopoulos – Georma 2012, 37, pl. XIVc–d.
993 Seals as part of necklaces are only reported in the so-called warrior graves that postdate LM IB around Knossos and in the Peloponnese (Dimopoulou 1999, 29).
994 Televantou 2000, 837, fig. 2.
995 Doumas 1992, 176–79: Xeste 4, staircase; Vlachopoulos – Georma 2012, 40–41.
996 Doumas 1992, 146–51, figs. 110–115: Xeste 3, Room 3b; Vlachopoulos 2008, 452.
997 Vlachopoulos – Georma 2012, 35.
998 Televantou 1984.

Almost from the outset, Cretan seals circulated widely in the Aegean, and sometimes beyond. Phylakopi presents us with some of the earliest seals to have been manufactured in the Aegean, which seem to fit well with EM II examples from south-central Crete,[999] where the earliest Cretan seals are attested around the mid-third millennium BC. The manufacture of seals is not as widespread as, for instance, the making of pottery: it requires specialized craftsmen, special tools and, if higher quality was desired, special raw materials such as hard stones or metals. Seals **S7**, **S8**, **S10** and **S13** that were made locally at Akrotiri — as indicated by their manufacture material — are rough, crude and clumsy. Admittedly, it could be mere chance that we have not yet retrieved the Theran masterpieces of glyptic, but on present evidence it seems highly unlikely that we ever will.

The almost total absence of any evidence for locally-made seals is echoed by a similar lack of locally-made figurines or other artefacts that might indicate some interest in rendering shapes or motifs three-dimensionally. Artefacts of this kind are simply imported, such as the head of a clay figurine retrieved in the VDL[1000] and a clay flask of MM IIIA date with a bull and lion rendered in relief.[1001] These constitute the few examples of objects in relief or in the round amidst the wealth of finds at Akrotiri that are not made locally. While some locally-made objects rendered in relief or in the round do occur, they always appear to imitate prototypes of Cretan inspiration: some relief decoration on LC I pottery; relief wall paintings on two of the walls of Room 9 on the second floor of Xeste 3;[1002] locally-produced stone tools and vases.[1003]

Local seal production, as attested through the few examples retrieved from LC I contexts, points to yet another differentiating factor with its contemporaneous Cretan output. Leaving aside the unique specimen without a suspension hole **S7**, the three other local products **S8**, **S10** and **S13** share an element in common. They all have a suspension hole, as do all Cretan seals, but their shape was not suitable for wearing on the wrist; instead they could be hung around the neck, as pendants. Whatever purpose these pendant seals may have served, the fact remains that they differ greatly in concept from what their Cretan counterparts had evolved into by the Neopalatial period. In Crete, pendant seals were an obsolete Prepalatial or, at the most, Protopalatial notion. The only Cretan seal shape at Akrotiri suitable for use as a pendant is *Petschaft* **S15**; the round face of these seals that is combined with a narrow grip would, however, make even *Petschafte* rather inconvenient pendants. Local pendants **S8** and **S10** have a shape more suited for suspension than *Petschafte*, but also than the local **S13**.

It is a common misconception to attach some sort of special significance to seals or even to the contexts in which they occur,[1004] but this inference is not necessarily justified. In the case of Akrotiri — at least for the latest phase of the settlement's life when the evidence is most plentiful — seals do not appear to have been integrated into the local culture: they

999 Younger, in Renfrew *et al.* 2007, 455; *CMS* V Suppl. 1B nos. 35, 36.

1000 Maniki 2003.

1001 Knappett – Nikolakopoulou 2008, 19 no. 34, fig. 17, with a parallel from Anemospilia in central Crete.

1002 Vlachopoulos 2008, 463, fig. 41.46.

1003 Devetzi 2000.

1004 For an instance of both, see Papagiannopoulou 1995, 209–12, where two seals out of four known at the time to have been found at Akrotiri appear in a list of what makes Xeste 3 stand out from the rest of the buildings. The phenomenon of overstating the importance of seals is of course not limited to Akrotiri.

were not assimilated, they were not emulated, they were not reproduced.[1005] Yet for some reason, or conceivably for several, they circulated and found their place within Akrotiri, kept mainly in storerooms. In one instance, namely the seal found in Room D16, a room seemingly containing items intended for trade or exchange, the seal itself may have been destined for exchange.

Although there is no convincing evidence that any of the seals recovered at Akrotiri were actually used for sphragistic purposes, one cannot entirely dismiss their possible significance on a symbolic level. After all, seals were items imported at Akrotiri and, more importantly, they were imported from Minoan Crete. The economic and cultural hegemony of Neopalatial Crete over large swathes of the Aegean is undeniable. Leaving aside futile discussions as to whether cultural hegemony can be translated into political domination, one can accept that seals were undeniably a Cretan 'brand' product and were apparently recognized all over the Aegean as such.

Although there is scant evidence for elucidating the role and importance of seals at Akrotiri, some insights can be gained from a more general knowledge of Minoan Neopalatial glyptic. We cannot help but notice that the examples found at Akrotiri belong to large and common categories of Neopalatial seals, while seals that might potentially have been used in formal administrative practices, as known on Crete, are absent. The Neopalatial seals retrieved at Akrotiri were overwhelmingly made of soft stone; a high proportion are lentoids, a common Neopalatial seal shape; their colours, red and green, are also common. Examples of hard stone seals are rare: the few made of jasper are also red, which happens to be the most common colour associated with this stone. Their decorative motifs range from simple geometric to 'talismanic' and simple versions of the 'tectonic' motif. In a nutshell, the seals that ultimately reached Akrotiri, so far known from archaeological investigations, were definitely not among the highlights of Cretan glyptic in terms of materials, shapes and decorative motifs. By contrast, the highlights of Cretan glyptic can be seen among the administrative seals used to impress the imported sealings that have been recovered in the vicinity of these seemingly unimportant, yet mainstream Cretan seals.

What also emerges are conspicuous contrasts between the imported seals and those produced locally. The latter are defined in this study as 'traditionalist', i.e. showing tendencies and priorities that stem from earlier times and bear little, if any, relation to the dominant, overtly minoanizing narrative in LC Thera, as expressed in architecture, pottery manufacture and wall painting, among other social activities. Local manufacture should have been by definition a dynamic process, expressing local choices, preferences and needs. Yet in the case of seals it seems to have looked for inspiration and prototypes in the past and to have largely ignored trends, achievements and habits of the times. The importation of seals appears to have stagnated at the static level of reception of finished products, since no imitation or creative reproduction is known to have taken place.

1005 Notice at the other end of the spectrum the extremely well assimilated wall painting iconography at Akrotiri (Blakolmer 2016).

THE IMPRESSED NODULES

The extensive overview of the findspots of the Akrotiri sealings and the shorter survey of sealings in Crete do not provide us with a consistent picture of the locations where sealings were found and/or kept. Although these sealings have always been considered 'official' documents, many have been retrieved in Crete in what appear to have been 'private' buildings and establishments, such as House A in Zakros and the Agia Triada and Sklavokambos 'villas'. Relevant finds in palatial settlements and in the palaces themselves have caused researchers fewer difficulties in interpretation. So far no building at Akrotiri can be regarded as a 'palace' in the Cretan sense. The Xeste buildings are viewed as 'public' buildings, but their character is mostly seen as ceremonial; no administrative functions have ever been claimed for the Xeste 'public' buildings. The findspots of sealings at Akrotiri point to 'private' houses, but this does not rule out a potential 'public' character for the transactions between Crete or specific localities in Crete, and Akrotiri.[1006]

In the broader scheme of things, however, we do not know what part of the settlement is represented by its excavated portion. More importantly, we have no means of comparison, since no other pre-eruption settlements have been investigated as extensively on Thera as Akrotiri.[1007] Based on our present knowledge concerning the extent of the settlement, and thanks to the trenches investigated for the new shelter, it seems that the town of Akrotiri extends further in all directions. Trenches opened on the periphery of the modern archaeological site show more buildings in all directions; their architecture, as well as the arrangement of open spaces and streets, show no elements that are new or of inferior quality in comparison to those already known. The only element they seemingly lack is a room or rooms with wall paintings, though conceivably this is a *lacuna* in our finds. We are, however, still uncertain as to the significance of rooms with wall paintings, as opposed to other rooms in the building that were undecorated, or indeed buildings that lack wall paintings altogether.[1008] These observations mean that although the building where the sealings were found was apparently a residential building, like many more in the excavated part of Akrotiri, the characterization of its status or that of its inhabitants is by no means readily available.

A potential function of a room in the building unit Delta-East, the main findspot of sealings at Akrotiri, as a centre for exchange, one of many on the site, has been suggested in this study. A number of arguments have been put forward with regard to such a function, thought to have been fulfilled by the largest ground-level room in the unit, Room D21. The interpretation of one room in a building as an exchange centre does not cover

1006 A relevant discussion about Crete in Tsangaraki 2006, 281–312; *pace* Argyrou-Brand 2012. The instance of the LBA Ugarit-Ras Shamra on the Syro-Palaistinian coast is instructive on the matter, since all excavated private houses with archives belonged to higher officials, priests or scribes, i.e. professionals serving the state hierarchy; their archives, although stored in private property, were also always connected with state bureaucracy (van Soldt 2000).

1007 That habitation was not limited to Akrotiri during the latest pre-eruption period is suggested by numerous surface finds. Only one other site, however, has been partly excavated so far in the locality of Raos to the N of the modern village of Akrotiri and facing the caldera (Marthari 2004, where a number of sites of similar date, especially in the region around Akrotiri, are listed).

1008 Doumas 2005. For the presentation of one of these 'peripheral' sections of the settlement, see Moschou – Karnava forthcoming.

for the whole building, which retains its characterization as a habitation and storage site. An involvement of a further stamped clay nodule in exchange transactions elsewhere in the settlement, while not exactly comparable with the finds of Delta-East, appears to reinforce the connection between sealings and trade functions at Akrotiri.[1009] What weakens this interpretation is the fact that rooms in different buildings that have been previously described in literature as probable exchange centres, namely D16 and A1, have produced no relevant finds.

A probable archival role for the hoard of sealings found in Room D18b does not preclude the possibility that the same sealings played roles other than this final one. Moreover, the fact that the sealings functioned as archival dockets does not mean that the room(s) in which they were found — including the ones where they may have been kept initially and those to which they were apparently transferred subsequently — qualify as archives per se. We are far from establishing the existence of archival rooms in Cretan Neopalatial sites, and this problem extends to Akrotiri. In Crete, our tablet and sealing 'archives', which are at times found fallen from the upper floor, or scattered between rooms because of the violent destructions of the buildings they were kept in, cannot be easily listed under 'living' or 'dead' archives, with the former being functional and operative collections of documents and the latter considered more or less as discards.[1010]

So, before sealings had assumed their archival role, it seems that they were first and foremost administrative documents intended to be dispatched. Whether such a purpose applied to all sealings remains to be established by investigating examples found throughout Crete. It seems unlikely, however, that what we are seeing at Akrotiri is the exception, since all the characteristics of the Akrotiri sealings agree perfectly with those of sealings from Cretan Neopalatial sites.

Akrotiri has produced evidence to indicate that almost all categories of stamped Neopalatial administrative documents were meant for transportation at some point during their use. The only category not attested at Akrotiri, that of roundels, can be in any case included under 'documents for transportation', since they are thought to have functioned as 'dockets' issued in exchange for products. The main and most numerous type of sealings attested at Akrotiri, the flat-based nodules, are regarded in current scholarship as document sealings; they were intended to accompany leather documents containing written texts. The archival hoard of documents in Room D18b thus consisted of leather documents and/or their clay sealings, together with one single-hole and one two-hole hanging nodule. The initial question, concerning the 'indexical' role of seals and sealings at Akrotiri, should also be extended to the potential 'indexical' role the leather documents had before and after they reached Akrotiri.

The techniques involved in making flat-based nodules suggest that the preparation of these sealings must have been some sort of taught and learned process. The standard methods of manufacture — some also observed on Cretan examples that postdate the Akrotiri nodules by some 80–120 years — indicate a well-established process, which had been practised for

1009 That sealings could have been somehow involved in exchange transactions at Akrotiri is far from supporting the theory of a 'commercial Aegean koiné' in the LC I period, as suggested in Argyrou-Brand 2014; sealings are too fragile to carry the burden of proof of such broad interpretations on their own.

1010 Lauinger 2011, 23. The notions of 'living' and 'dead' archives have been devised on account of Neo-Babylonian material (Jursa 2005).

some time before the sealings were dispatched to Thera and which persisted after Thera was destroyed by the devastating volcanic eruption. For this observation, we consider: the flat-based nodules of the Knossos 'Hieroglyphic Deposit', probably the earliest specimens of the type;[1011] the sole flat-based nodule from the Malia palace deposit, dated to the later part of MM III (1630/1730 BC); the Knossos Eastern Temple Repository evidence, placed at the transition between MM III and LM I (1600/1700 BC); then the Akrotiri evidence, dated at or near the end of LM IA (1530/1623 BC). Akrotiri seems to fall within the first 100 years of flat-based nodule manufacture and use in Minoan Crete; the next node in our time-line is the main bulk of the flat-based deposits from all over Crete, evidenced in the widespread destructions of LM IB (1450/1500 BC).

The transport of written documents from Crete to Thera could be seen as a form of correspondence. Correspondence, however, involves the notion of reciprocity; as things stand, there is no evidence to suggest that anything similar, either written leather documents, or stamped clay sealings, could have been prepared at Akrotiri and sent elsewhere. We lack all evidence for the necessary administrative tools, namely seals that could have participated in administrative practices. In Crete we have the instance of sealings strongly reminiscent of one site that are found at another, such as a sealing with seal impressions readily recognizable among the Zakros material, found at Sklavokambos (see *Fig. 101*). This sealing could be seen as evidence of 'correspondence' only if we assume that the sealings found at Zakros truly reflect locally-practised administrative actions. But the Akrotiri evidence argues against the idea of non-mobile sealings; and no longer can we view sealings recovered at any given site as, by definition, indicative of local administration.

We do have evidence at Akrotiri for locally-made clay tablets written in Linear A; hence the presence on-site of scribes is undeniable. The few attestations of Linear A in the Cycladic islands of Kea, Melos and Thera have been discussed elsewhere[1012] and it has been established that the writing system we are seeing in the Cyclades is precisely the same as that employed in Crete: the same syllabic and logographic signs, the same ligatures, the same numerical and fractional system. More importantly, however, the graphic varieties of Linear A signs in the Cyclades, what we would call today hand-writing styles, correspond to graphic varieties of Linear A signs in Crete. This does not, however, allow us to determine whether the Linear A scribes active in Thera were local individuals trained in Cretan 'scribal schools', or even actual scribes of Cretan origin.[1013] Nonetheless, the fact remains that Linear A in Thera was constantly and closely connected to the Cretan version(s) of

1011 Müller, in *CMS* II,6 p. 349. Hallager (1996, 135) suggests that 'proto'-flat-based nodules are attested in the Phaistos sealing deposit.

1012 Karnava 2007–08; 2008. A correction is due, in that one of the inscribed vases from Akrotiri compared in Karnava 2007–08 to Cretan evidence (THE Zb 2) with the purpose of establishing paleographic affiliations between Thera and Crete is not of local origin, but is most probably imported from Crete (see Chapter 3, n. 803; also Notti 2011, where the comparisons, including the mistaken local attribution, are repeated).

1013 *Pace* Argyrou-Brand 2014, 128, who argues that scribes at Akrotiri were of local origin because one of the ligatures attested on the Akrotiri Linear A tablets is unique (Boulotis 2008, 77, tablet THE 8, ligature AB 54 + AB 09). The argument is, however, very thin because the remaining signs on the tablets and on all the other documents found at Akrotiri do not exhibit any peculiarities or novelties with regard to the Linear A attested in Crete. From the paleolographical point of view, Linear A documentation in general is so scanty that the existence and future discovery of more logograms should not surprise us.

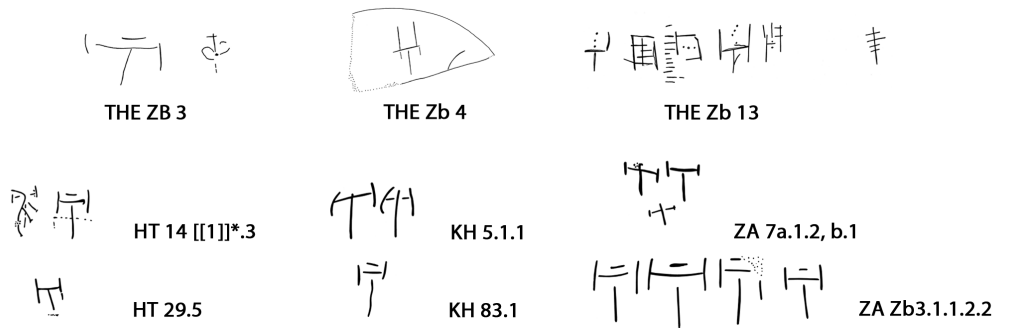


Fig. 118. Linear A inscriptions from Akrotiri and comparable palaeographical evidence from Cretan sites (adapted and corrected from Karnava 2007–08, 406, fig. 8).

Linear A, as Theran Linear A graphic varieties attested on documents found in Agia Triada, Chania and Zakros, demonstrate (*Fig. 118*).

Yet the exact relationship between scribes of clay tablets and administrators with the authority to stamp remains a matter of debate; individuals literate in Linear A would certainly have been able to read any information written on the leather documents, since there is no reason to suggest that this was written in anything other than in Linear A.

Evidence from the Akrotiri flat-based nodules indicates that the leather documents sealed by the clay nodules corresponded in size to Linear A tablets (*Fig. 119*). The small size suggests that the information written on these documents may have corresponded in format and content to that found on the clay tablets, i.e. the leather documents could also have contained logistic data in tabular form. A leather document could have offered the possibility for information to be written on both its sides and, as it happens, among Linear A tablets the phenomenon of opisthography, i.e. inscribing on both sides of a clay tablet, is also attested. Such registration contents would reinforce the relationship between the scribes working on tablets and leather documents; one might even go so far as to identify one group with the other. Whether administrators who handled seals should also be identified with scribes is best left open. At Akrotiri the presence of Linear A scribes is attested by the existence of clay tablets made on the spot; there is nothing, however, to indicate the presence of administrators with seals on the site.

We should note here that leather (to be made into writing material) was a relatively costly product to manufacture and consume, and we have very little evidence for leather being used in antiquity for such mundane purposes as logistic accounts. In the Egyptian context, which provides our closest evidence, leather as a writing carrier appears to have been reserved for more formal activities, such as the copying of religious texts, whereas papyrus was the medium reserved for day-to-day bureaucratic transactions. Writing on leather in Egypt is reported in the sources as early as the Fourth Dynasty, but the earliest surviving example has been until recently a fragmentary roll dating to the Sixth Dynasty.[1014] Now, a leather roll of 2.5 m written on both sides, dating to the end of the Old Kingdom and the beginning of the Middle Kingdom, is suggested to be the oldest leather document

1014 Diringer 1982, 172.

Fig. 119. A specimen of a typical Neopalatial Linear A clay tablet from Agia Triada measuring 5.1 × 5.7 × 0.7 cm (GORILA I no. HT 35; image courtesy of the *ÉfA*/J.-P. Olivier).

with religious texts discovered in Egypt so far: it attests to the so-called Coffin Texts, and has 'colourful drawings of superb quality'.[1015] Although the document was meant to be portable, it is thought that leather documents served as master copies of texts that were later copied on papyrus, a considerably less expensive writing material. These portable documents were carried by priests who recited religious hymns; throughout the Middle Kingdom they were copied in burial monuments.

Again from Egypt come the oldest inscribed papyri from a port site on the Red Sea coast, Wadi al-Jarf;[1016] they date to the Old Kingdom and refer to the reign of pharaoh Khufu of the Fourth Dynasty. They include accounts of daily and monthly food deliveries from different areas as far as the Nile Delta, but also a sort of daybook of activities kept by a Memphis official who oversaw more than 200 men working on the construction site of the Khufu pyramid in Giza, a site totally unrelated to the findspot of the papyri. Both categories of papyri contained registrations in tabular form, and they both pertained to financial and administrative duties (*Fig. 120*).

The use of leather as a writing medium is widely regarded as an invention of the second century BC, when the discovery in the city of Pergamon in Ionia of a specific method of turning animal hide into what came to be known as parchment, proved to be the beginning of a new era in the literate cultures that followed.[1017] Yet, earlier still, Herodotus in a famous passage confirms that the use of leather for writing had been known in his time

1015 Sherbiny 2017a; 2017b.

1016 Tallet – Marouard 2014; Tallet 2017.

1017 Diringer 1982, 170–95, where the 'invention' is described as a gradual process and not sure to be have originated in Pergamon. Parchment, in Greek *περγαμηνή* > of *Πέργαμος*.

Fig. 120. The oldest papyri discovered so far in Egypt dating to the reign of Khufu (Fourth Dynasty) (Tallet – Marouard 2014, 9, fig. 12; image courtesy of Pierre Tallet and Gregory Marouard).

among Ionians.[1018] Herodotus claims that the use of leather for writing is something that barbarians would do, but his contemporary Thucydides, and others in the same century, recounts the Spartan method of dispatching *σκυτάλαι*, i.e. staffs or buttons around which rolls of leather was wound.[1019] It is therefore probably safe to assume that the use of leather for writing was known throughout the Mediterranean world in the fifth century BC and even before.[1020]

The difference between sheep or goat's leather, which had been used as writing material in the millennia before the invention of parchment, lies in its process of manufacture. Leather was tanned, namely treated with vegetable products, a process which causes an irreversable chemical change in the dermal network and turns skin into leather; parchment, on the other hand, was dried under tension, a procedure that causes a restructuring of the dermal network and a henceforth permanent stretching of fibres. Investigations into animal skin manuscripts from Egypt have pointed out that the distinction between the two is not always clear-cut.[1021] Whether the technique of producing parchment had already

1018 Hdt. 5.58: *'καὶ τὰς βύβλους διφθέρας καλέουσι ἀπὸ τοῦ παλαιοῦ οἱ Ἴωνες, ὅτι κοτὲ ἐν σπάνι βύβλων ἐχρέωντο διφθέρῃσι αἰγέῃσί τε καὶ οἰέῃσι: ἔτι δὲ καὶ τὸ κατ' ἐμὲ πολλοὶ τῶν βαρβάρων ἐς τοιαύτας διφθέρας γράφουσι'* (The Ionians have also from ancient times called sheets of papyrus skins, since they formerly used the skins of sheep and goats due to the lack of papyrus. Even to this day there are many foreigners who write on such skins.).

1019 Thuc. 1.131*: 'πέμψαντες κήρυκα οἱ ἔφοροι καὶ σκυτάλην'* (and the Ephors … sent him a herald and a scytale with orders); see Jeffery 1961, 578, for how the *skytale* functioned, as explained in later authors.

1020 Reed 1972, 118, 277, where the earliest parchment appears to have been made of camel skin and was found in what is today Jordan dating to the eighth century BC.

1021 Leach 1995.

been invented in Minoan times or not, is presumably a question that cannot be answered on the basis of the leather imprints we are left with.

In Minoan Crete we have no evidence of papyrus use for writing and, in any case, papyrus would have been an imported writing material.[1022] Leather, on the contrary, could have been locally produced, notwithstanding the fact that its manufacture was never easy or inexpensive. An extra benefit would be that the text on it could be erased and a new text could be written creating the so-called *palimpsests*, so well known to paleographers who study parchment manuscripts; on the other hand, a document that could be tampered with and its information altered was more likely to require safeguarding, such as that provided for by the clay sealing. If Minoans had indeed chosen leather for bureaucratic or any kind of administrative accounts, they seem to have made an exclusive and relatively high-valued choice.[1023] In addition, whichever method they used for the preparation of the writing surface, it must have been perfected rather well, because the leather imprints appear smooth and even, with no left-over traces of animal hair or their roots, as are visible on a preserved, roughly contemporaneous, mathematical leather roll from Egypt.[1024]

THE MINOAN NEOPALATIAL ADMINISTRATIVE SYSTEM

The study of the Minoan administrative evidence at Akrotiri permitted a number of observations to be made on how administration was organized in the Neopalatial period. The observations derived from the Akrotiri flat-based nodules, as well as comparanda from various Cretan sites, which were examined by the author in the museums of Herakleion and Chania in Crete, and the Ashmolean in Oxford. These reveal that there is no difference whatsoever between the Akrotiri sealings and those found in LM IB layers in Crete, whether in terms of manufacture or stamping patterns. In other words, unless we were told of their findspots, we would have no way of telling where they had been found.

The flat-based nodules found in Room D18b of building unit Delta-East at Akrotiri appear macroscopically to have been made from three different clay pastes (*Fig. 107*). These macroscopic identifications are bolstered by the simple fact that the Akrotiri nodules are unfired, thus preserving the original colour of the clay paste from which they were made. The very existence of a variety of clay pastes implies that the manufacture of the Akrotiri hoard should be attributed to different episodes in time and, most probably, also in space.

The Akrotiri flat-based nodules, as well as the flat-based nodules retrieved in Crete, present us with the phenomenon of collaboration between administrators with seals. Apart from those with a single seal impression, most flat-based nodules were stamped by two different seals. A total of 16 seals had been used for stamping the Akrotiri flat-based nodules;

1022 Although not necessarily from Egypt, if we take into account the instance of the ancient Greek word for the papyrus roll, namely *βύβλος/βυβλίον*, 'which shows clearly that their [the Greeks'] original source for it was not Egypt itself, but the Phoenician port of Gebal, which they called Byblos'. As far as the papyrus cost in the Greek world is concerned, 'even in the late fifth century it [papyrus] was an expensive import' (Jeffery 1961, 56–57).

1023 Jeffery (1961, 56–57) suggests that the production of leather as a writing medium could not have been cheap even in the first millennium BC, since its manufacture was a lengthy and multi-stage process.

1024 Diringer 1982, 174, fig. V2.

of these 11 collaborated amongst themselves in different cases and in different combinations to stamp the nodules. It also proved possible to distinguish two 'groups' among the Akrotiri flat-based nodules by using additional criteria (*Fig. 106*). These included: two distinctive ways of preparing the clay nodule in relation to the leather document beneath; two distinct sizes of the clay nodules, namely large and small; and the differentiation by clay paste. It is not suggested that these 'groups' constitute different types or subtypes of flat-based nodules and they do not necessarily hold good for nodules found elsewhere.

The seal impressions in 'Group 1' provide a graphic illustration of the interaction between seals and, consequently, the adminstrators who used them. While both groups demonstrate that administrators collaborated to produce sealings, only in 'Group 1' do we find that certain administrators not only collaborated with others, but also had the capacity to stamp flat-based nodules single-handedly with a single seal. These are defined in this study as 'first rank' or 'dominant' administrators, as opposed to their stamping partners, who never stamped anything single-handedly and who are here termed 'second rank' or 'subordinate' administrators (*Fig. 111*). The same phenomenon of solitary-cum-collaborative stamping can also be observed among sealings from House A in Zakros and Agia Triada (*Figs. 112, 113*). Together with observations derived from the Sklavokambos sealings, the picture emerges of an administrative organization with a defined hierarchical structure, one which extends from Akrotiri to multiple sites in Neopalatial Crete (*Fig. 115*).

A consideration of the seals used by the administrators embedded in this hierarchical system shows that these were indicative of status. The size of seals, and especially of signet rings, appears to have played some role in their being assigned to such adminstrators. Furthermore the motifs on these seals also seem to have been significant, in terms of the chosen theme and the level of complexity of its rendering.

The picture that emerges from examining this set of Neopalatial sealings from Akrotiri in combination with their Cretan counterparts is that of an administrative system with repetitive, strict and long-lasting features. Its seemingly uninterrupted administrative continuity throughout the LM I period, during which as many as three generation of scribes and administrators worked, ended, as all administrative systems do, with the demise of the state authority that ran it.[1025]

PARALLELISMS TO THE MINOAN NEOPALATIAL ADMINISTRATIVE SYSTEM

It is not clear when the Neopalatial adminstrative system was first devised. The transition from the administrative practices of the Old Palaces, as observed at Petras, Malia and Phaistos, seems to have taken place over the course of MM III. Our best guess is that this occurred towards the end of that period, some time between the Malia *Depôt hiéroglyphique* and the Knossos Temple Repositories. Consequently, the system seen at Akrotiri had not been established very much earlier in time.[1026]

1025 Recent evidence suggests that the LM IB destructions in Crete were not contemporaneous (Christakis 2011, 253, and various papers in the same volume).

1026 See Chapter 2, pp. 147–49.

The system seems to have been a Minoan invention, but the extent to which it developed out of earlier Protopalatial practices is unclear. It certainly bears no relation to the Egyptian evidence mainly from the Middle Kingdom, the period roughly preceding the establishment the Cretan Neopalatial sealing system. The Egyptian material mostly comprises direct sealings that evidently sealed bags, boxes, pegs, jars and textiles,[1027] which is why any comparisons with the Aegean evidence attempted in the past resort immediately to the third millennium BC Greek mainland material, primarily from Lerna, and Protopalatial Phaistos in Crete.[1028] In addition, document sealings with a single seal impression are attested in Egypt on letters in the form of folded papyri, which contained correspondence dealing with administrative affairs (at various levels, higher and lower).[1029] But these resemble more what one would define in the Aegean as 'two-hole hanging' nodules. Papyri sealings similar in shape to the Minoan flat-based nodules only appear in Persian layers in Egypt, such as one from debris layers dating to the 27th Dynasty in the site of Tell el-Dab'a.[1030] It seems, furthermore, that *noduli* were also present in Egyptian contexts.[1031] But there they have been interpreted as 'seal impression models', found together with seals in administrative offices or where the sorting and registration process took place.[1032] The Near Eastern and Mesopotamian evidence bears even less resemblance to any Aegean stamping habits of the second millennium BC, with the extensive use of cylinder seals, stamped clay tablets and 'bullae';[1033] regarding the latter, the Hittite 'bullae' refer to a type of impressed clay document that was wrapped around a knot and hung on a string, a variety that recalls the Minoan single-hole hanging nodules.[1034]

A further note is reserved here for potential parallels for parts of the Minoan Neopalatial administrative system. In surveying the literature, to see if there was any recurrence of the system, two instances kept coming up, wholly unrelated to Minoan Crete in time and space. They both concern Mesopotamia and each is interesting on its own merit. The first instance is the Neo-Assyrian empire of the ninth to sixth centuries BC, where seals could be used by private individuals,[1035] but also adhered to what was considered their original and most fundamental function, namely as vehicles of state administration.[1036] Privately-owned seals were meant to be unique, but state seals had a specific and repetitive range of motifs. Moreover, while personal seals were overwhelmingly restricted to the typical Mesopotamian shape, the cylinder seal, state seals reverted to what again became *en vogue* in the Neo-Assyrian period, the stamp seal.

1027 Evidence deriving from the Uronarti and Askut fortresses (Reisner 1955; Smith 1990); from the town of Elephantine (von Pilgrim 1996); from a mortuary temple in Abydos (Wegner 2007); more recently, some 1400 sealings from Tell Edfu seem to be of the direct type (Moeller – Marouard 2011).

1028 Heath Wiencke 1976.

1029 An illustration of the various types of Middle Kingdom sealings in Picardo 2015, 258, fig. 11.8.

1030 Collon – Lehmann 2011, 69 no. 9437, measuring 1.82 × 1.58 × 0.7 cm.

1031 Foster 2001, and more examples to be found in various articles in the same volume.

1032 Gratien 2001, 68.

1033 *RLA* 12, 469–74, *s.v.* 'Siegelpraxis. B. Archäologisch'; 466–69, *s.v.* 'Siegelpraxis (sealing practice). A. Philologisch'; a useful overview in Tsouparopoulou 2014, 46–52.

1034 Herbordt 2010, 214, 224, fig. 6.

1035 Herodotus even mentions that every Babylonian owned a seal (Hdt. 1.195: *'σφρηγῖδα δὲ ἕκαστος ἔχει'* [every man has a seal]) (quoted in Radner 2008, 482).

1036 For an overview, Herbordt 1997; Radner 2014 discusses state correspondence.

Certain Neo-Assyrian state seals have been interpreted as 'bureau seals',[1037] denoting 'seals that are associated with a particular administrative department — a "bureau" — rather than a specific person and that exist in a number of copies'.[1038] People of high authority, the king, the queen, the crown prince, a governor, had their 'bureau'; the seals used within their 'bureau' were characterized by simple motifs and were deliberately made to resemble one another when used during the same period. None of these 'bureau seals' survives, but in a striking comparison with Minoan material: 'from references in the textual record it is clear that these objects, which are always called "signet ring" (*unqu*) rather than "seal" (*kunukku*) or "neck seal" (*kišādu*), were made of gold'.[1039] It is suggested that the stamping with rings rather than cylinders was a habit already attested in the LBA to the W of Assyria, namely in the kingdom of Aštata and its capital Emar, modern Tell Meskene in Syria, with finds from levels corresponding to the Mycenaean period in Aegean terms.[1040] The ring seals in question are said to have been issued by the king himself and bore iconography that was well known and recognized as royal; that copies of royal seals circulated was known to the king, as shown in textual references of the time. The seals stamped documents dispatched to the king's subjects with orders regarding administrative or economic affairs. Again, strikingly similar to the Minoan material, the sealings stamped by these 'bureau seals' appear to have been used 'in a wide range of administrative contexts: they were impressed on sealings protecting writing tablets, on sealings securing the contents of sacks, boxes and jars and on clay tags … that were originally attached to an object by means of a loosely hanging string.'[1041]

The case just described exhibits remarkable similarities to evidence from Neopalatial Crete in terms of the materiality of the administrative practices used. It goes without saying that similarities in formal attributes are in this instance purely coincidental, since the time span separating the Minoan from the Neo-Assyrian world is unbridgeable. Neo-Assyrian 'bureau' seals do however recall the Minoan administration rings, especially the ones with the bull-leaping iconography, in that both systems are based precisely on the repetition of motifs on seals. In this respect it is interesting that the Neo-Assyrian evidence is interpreted as an administrative technology devised to assist the running of a newly-developed empire and grew out of the need to delegate bottom-down royal authority.[1042] Scholars have even gone as far as suggesting that the Assyrian state became successful and stable partly due to 'innovations in administrative technology, the kind that allowed a world-empire to act like a world-economy'.[1043]

1037 Not to be confused with the so-known 'office seals' in the Achaemenid period, the seals that were used, among others, to stamp the Persepolis Fortification Tablets (509–494 BC) (Root 1999, 166). In the Near Eastern literature, 'office seals' were unique seals presumed to have been handed down over generations and used by subsequent holders of the same office. A closer reading of bibliography reveals however that this theory is based merely on the later use of antique seals and there is no instance of these seals actually attested through their impressions to have been used over time (Klengel-Brandt – Radner 1997, 147–49; Radner 2008, 486).

1038 Radner 2008, 486.

1039 Radner 2008, 488.

1040 Beyer 2001; Herbordt 2010, 221.

1041 Radner 2008, 490.

1042 Radner 2008, 481–82, 508.

1043 Allen 2005, 76.

The second parallel for Neopalatial practices concerns flat-based nodules that were reserved for securing leather documents, which were dispatched to places other than where the sealed document was prepared. Sealings that strongly resemble the shape and overall appearance of the Minoan flat-based nodules are to be found again after a millennium had elapsed in the realm of the Achaemenid Empire from the fifth to the fourth century BC. Leather makes its appearance as material for writing letters of administrative and financial nature among a cache of documents kept in the Bodleian Library in Oxford and dating to the late fifth century BC.[1044] These letters were part of a small archive, mostly composed of letters sent from Arshama, a Babylonian prince, to people in Egypt: a fellow Persian official of high rank and two Egyptians, Psamšek and Nakhthor, who were managing his estates in Egypt. It is most likely that the cache — of unknown provenance since it first surfaced in the antiquities market in pre-war Berlin — derives from Nakhthor's archive kept in Egypt. The letters include: 'accountancy-culture, land tenure, satrapal remuneration, corvée labour, cross-regional ethnic movement, storage and disbursement of resources for state use, military systems, long-distance travel, the employment of skilled craftsmen, religious language and belief'.[1045]

The cache preserves the actual leather letters written in imperial Aramaic, the *lingua franca* of the period; their sealings, eight in total, stamped by two different seals; and fragments of two leather bags in which the leather documents with the sealings were most likely kept (*Fig. 121*). Seven of the sealings were stamped by the same cylinder seal with the motif of a combat scene and the name of Arshama and his title, and only one sealing was impressed by a stamp seal with a geometric motif. The leather documents were folded, wrapped in yellow thread, which is also preserved, and sealed by the sealings. Although evidently of a considerably larger size than the leather documents sealed in Minoan times,[1046] these letters present us with a vivid image of what a leather document would look like after it had been unfolded to be read. A second cache of leather documents from Bactria dating to some 80 years after the Arshama evidence, which has recently been published,[1047] waver between sizes such as 7.2 × 27.7 cm for the smallest[1048] and 29.1 × 49.6 cm for the largest.[1049] The Bactrian leather documents are additionally impressive in that they offer a unique glimpse into what a folded leather document with its clay sealing on top looked like, since one of the documents was acquired unopened (*Fig. 122*).[1050]

What is noteworthy in the Arshama letters is that the line between the public and the private sphere does not appear to have been fixed. Arshama was a satrap, but at the same time a landlord who tended to his affairs. In the letters, over and over again, he transcends

1044 Driver 1954. The Arshama letters offer an almost unique case of leather documents preservation from the ancient world besides leather documents from Egypt in the second millennium BC (see pp. 227–30 above).

1045 Ma *et al.* 2013, 2; also, *Arshama Letters*.

1046 Their publication unfortunately makes no mention of the sizes of the leather documents or the sealings, but they appear to be of sizes larger than the leather documents accommodated by the Minoan flat-based nodules. This suggestion is corroborated by the Bactrian evidence, see n. below.

1047 Naveh – Shaked 2012; see also, *Khalili Collections*, Aramaic Documents.

1048 Naveh – Shaked 2012, 152–56 no. B4.

1049 Naveh – Shaked 2012, 198–212 no. C4.

1050 Naveh – Shaked 2012, 187–91 no. C2: 'the document was opened for photography and re-sealed. It is preserved in its entirety and is clearly legible. Addressed to a superior officer, it announces the dispatch of 40 sheep.'

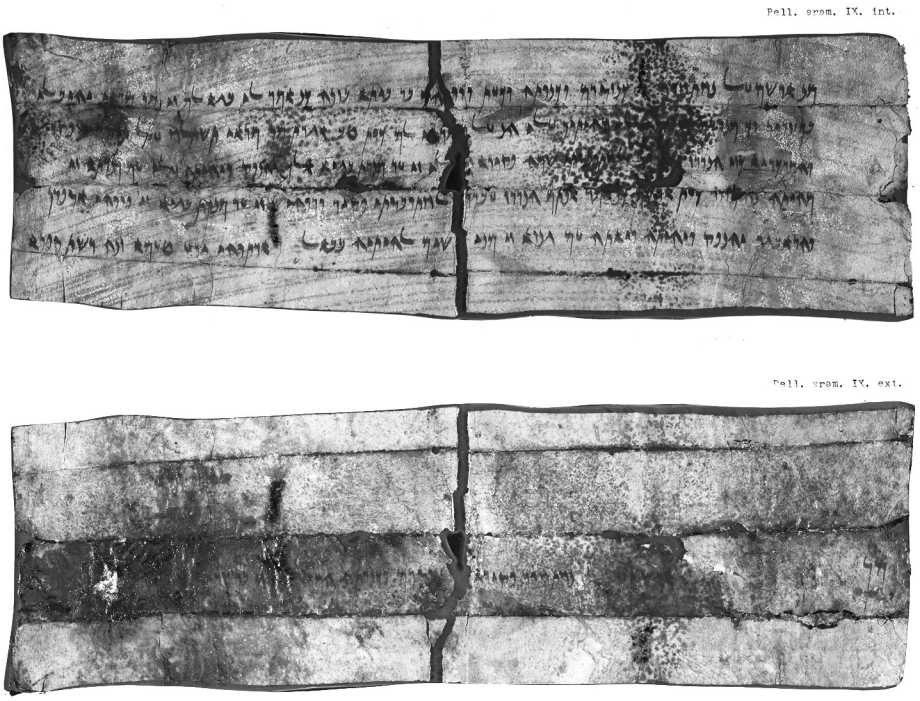


Fig. 121. A leather document sent by Arshama, an Achaemenid prince (late fifth century BC, Egypt; image © Bodleian Library, University of Oxford, 2018, Pell. Aram. IX. int./ext.).

Fig. 122. A leather document from the Khalili collection, found closed under its sealing, (right) and opened for a photograph (left) (Naveh – Shaked 2012, 187–91 no. C2; also, *Khalili Collections*, Aramaic Documents no. IA20).

the dividing line in order to service one or the other of his preoccupations and duties. The division was most certainly there, but the letters show an effort to negotiate and even abuse the prerogatives of public office to the benefit of his private business.

The examples from historic periods mentioned previously are remarkable in different ways. In the Neo-Assyrian instance an explanation is proposed for the multiple specimens of seals with similarly rendered motifs within the same administrative environment, which is strongly reminiscent of the Minoan repetition of certain motifs. In the Achaemenid administrative paradigm, when compared to the Minoan evidence, it is impressive how two administrative phenomena separated by a millennium can be conceived with such an impressive resemblance in their material attributes. The common denominator between these two historical examples, so distant in time, is that the act of stamping indicated the authentication of transactions at an official state level, as suggested in this study was also the case in Minoan Crete.

AND SOME THOUGHTS ON THE MINOAN THALASSOCRACY

Two important issues seem to lie at the heart of Minoan studies: on the one hand, the relationship Akrotiri enjoyed with Neopalatial Crete, a matter that constitutes an essential component in the discussion on Minoan thalassocracy and the process of 'minoanization' in the Aegean; and on the other, whether Crete formed a single polity or more during the LM IA period. The nature of interaction between Thera and Crete was discussed extensively in the 1980s.[1051] The site of Akrotiri, which by the mid-1970s had been revealed more or less to the extent that is known to us today, became the most prominent case-study, since its minoanizing features during its latest pre-eruption occupation phase required some explanation.[1052] The discussion initially concentrated on whether Akrotiri had actually become a Cretan colony in its final days,[1053] but soon expanded to define and explain 'minoanization' in the Aegean, not only at Akrotiri, but in other areas where Minoan features had been detected.[1054]

A fundamental aspect in the process of 'minoanization' was the political organization of Neopalatial Crete, an issue which still remains problematic today. From the time of Evans onwards, *opinio communis* among scholars of Minoan Crete has attributed some sort of Knossian supremacy over the rest of the island. But political institutions are notoriously difficult to detect in prehistory, hence the 'special' relationship between Knossos and

1051 The question had been posed well before that date and was first introduced by the excavator of Knossos, A. Evans; see Renfrew 1964.

1052 But a fact probably indicative of how much Akrotiri was discussed in relation to the process of minoanization is its near disappearance from the latest volume on the matter (Gorogianni – Pavúk – Girella 2016).

1053 Setting the overall agenda: Branigan 1981. Regional case-studies: Agia Irini in Kea (Davis 1980; Schofield 1982; Davis *et al.* 1983). In addition, a conference was organized on this very topic, the Minoan thalassocracy: Hägg – Marinatos 1984.

1054 Recently, discussions encompass more holistic approaches, but also new regional case-studies: Abell 2016; Broodbank 2004; Karnava 2007–08; Davis – Gorogianni 2008; Girella – Pavúk 2015; Nikolakopoulou – Knappett 2016; Whitelaw 2005; Wiener 2013. Another conference was organized on the topic of Minoans in the Aegean: Macdonald *et al.* 2009.

other Cretan palatial sites seems more like a matter of conviction than a conclusion based on archaeological facts. In the 1990s the picture of a unified Neopalatial Crete under one ruler was challenged,[1055] and evidence was used to support the interpretation of political fragmentation.[1056]

The Minoan sealings found at Akrotiri could, in theory, provide ideal evidence for both these issues, i.e the relationship between Thera and Crete, as well as the vexed question of Neopalatial political organization. Brief thoughts on both problems are offered here. With regard to the first problem, it appears that the custom of seal manufacture and use, as known and attested in Crete, did not exist in Thera. It was evidently something foreign and peculiar and seems not to have been adopted. In this connection, we must assume that the presence of sealings at Akrotiri was a purely Cretan affair. Thus, their arrival at Akrotiri can only be seen in two ways: either as tokens of a Cretan administration settled at Akrotiri or as administrative documents destined for Cretans living among the local population. This study has suggested that the sealings served in product exchange or trade taking place at Akrotiri; the administrative branch dealing with these matters on-site would function as an *emporion*, a trading station.[1057] A role in trade for sealings issued by high-ranking officials does not preclude a political character: rather it brings together the political system and its desire and potential to control economic transactions, as is always the case in human history. Whether the presence of foreign sealings can be translated into political domination or annexation of Akrotiri by Crete is not something that the sealings alone can answer; the question is bound to remain unresolved as long as we are ignorant of the precise content of the leather documents.

With regard to the second problem, that of the political system in LM I Crete, what emerges from the Akrotiri sealings is that they were products of this highly original, complex and strictly-organized administrative system. It was implemented during the LM I period in Crete under a set of principles that appear to have been all-pervading and centrally organized. Sealings were manufactured on the basis of set and rigorous requirements, which suggest that the *modus operandi* was even taught. The Akrotiri sealings found in Room D18b demonstrate a certain homogeneity on account of the limited number of seals used for their stamping in different combinations. An administrative hierarchy is discernible in action: some, dubbed here 'first rank' or 'dominant' administrators, appear to have been hierarchically superior to their stamping partners, the 'second rank' or 'subordinate' administrators.

In addition, no administrative changes between LC I/LM IA Akrotiri and LM IB Crete can be detected, since the technical characteristics and the rationale on which the system was based appear to have remained unchanged. The continuity of the system is demonstrated through the apparent uninterrupted use, under comparable circumstances, of one signet ring bearing a chariot scene in LM IA and LM IB. The chariot ring stamped flat-based sealings single-handedly in LM IA, and continued to do the same in LM IB. Moreover, on at least one occasion in LM IB, the chariot ring cooperated with another seal to stamp a flat-based nodule jointly. Thus the capacity to stamp alone or in collaboration

1055 Driessen – Macdonald 1997.
1056 Schoep 1999b; Christakis 2011.
1057 See also the relevant discussion in Müller 2005b; Panagiotopoulos 2015.

with another seal does not reflect changes in administrative practices between LM IA and LM IB. On the contrary, apart from the chariot ring, the large bull-leaping ring at Akrotiri also provides evidence for both single-handed and joint stamping. The ring with the bull-leaping motif is the most 'active' among the seals used for the Akrotiri sealings. By use of the characterization as 'active' I do not refer to the high number of sealings this administrator stamped, rather to his/her manifold responsibilities, which included his single-handed stamping of sealings but also his/her collaboration with two different 'subordinate' administrators. It is noteworthy that this ring is no longer represented in the LM IB sealing deposits, which may indicate that it had been somehow deactivated and withdrawn from circulation. Nevertheless, impressions from more than 17 other rings with bull-leaping scenes are present in the LM IB deposits (*Fig. 66*).

By analogy with the Neo-Assyrian example described previously, the suspicion arises that the administrative system itself became one of the vehicles for the success and the stability enjoyed by Neopalatial Crete. The combined use of writing and stamping allowed for a more effective management and regulation of resources and product exchange. But, whatever effect the demise of Akrotiri had on the economy of the Aegean area, its absence as a node in a trading network does not seem to have affected Cretan administration and its intricacies, which continued to function and prosper for quite some time afterwards.

CATALOGUE

All dimensions are given in cm. All images are reproduced at a scale of 3:2 unless otherwise stated. The photographs and drawings follow a roll-out logic in the horizontal sense: the sides of each object are presented in horizontal 90° rotation, to be 'read' consecutively. There are some exceptions to this logic and are to be found among the seals and the stamped objects.

S1–S16: SEALS

The motifs are described as they appear on the seal face and not as they would appear on an eventual impression.

N1–N75: NODULES

All nodules have also been photographed from above and the same was done for the casts of theirs bases (lower row). In the case of one-seal flat-based nodules, only the two short sections and the face with the seal impression are shown, the long sections are not shown. The term 'possibly joins' suggests that it is rather likely that two pieces fit together; 'could join' means that it is less likely that two pieces fit together.

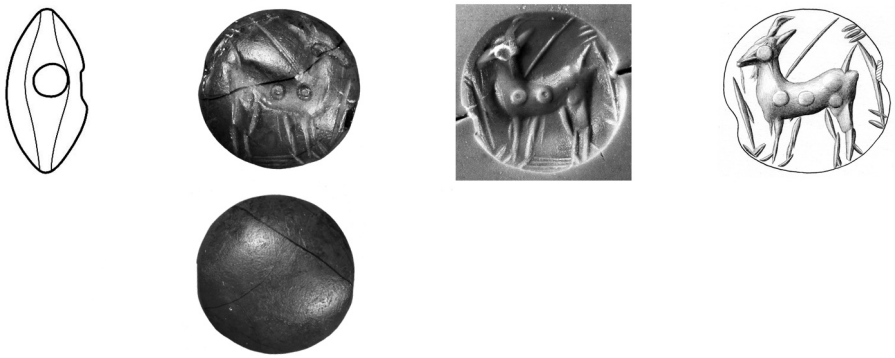
I1–I3: OBJECTS WITH SEAL IMPRESSIONS

Images of seal impressions are shown at a scale of 3:2. The images of the whole objects are shown at a scale of 1:2 (**I1**, **I3**) and 1:8 (**I2**).

SEALS

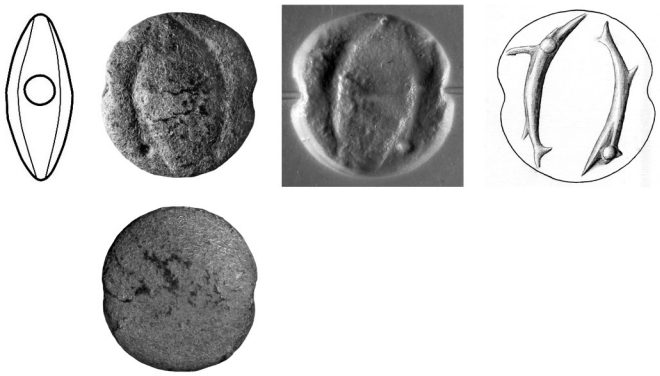
S1/Akrotiri L3136

Object type	Seal, lentoid
Material	Jasper, red-orange
Dimensions	Ø 1.33–1.41, Th. 0.74, Hole Ø 0.2–0.25
Motif	a: 'talismanic' speared goat standing in right profile, in front and behind the animal undefinable linear motifs; b: –
Stylistic dating	LM I
Preservation	Complete
Findspot	Complex Alpha (A), Western Quarters, Room 3-ground level (NPP 74); retrieved during flotation of floor soil sample
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	30/1/2001
Bibliography	*CMS* V Suppl. 3 no. 389



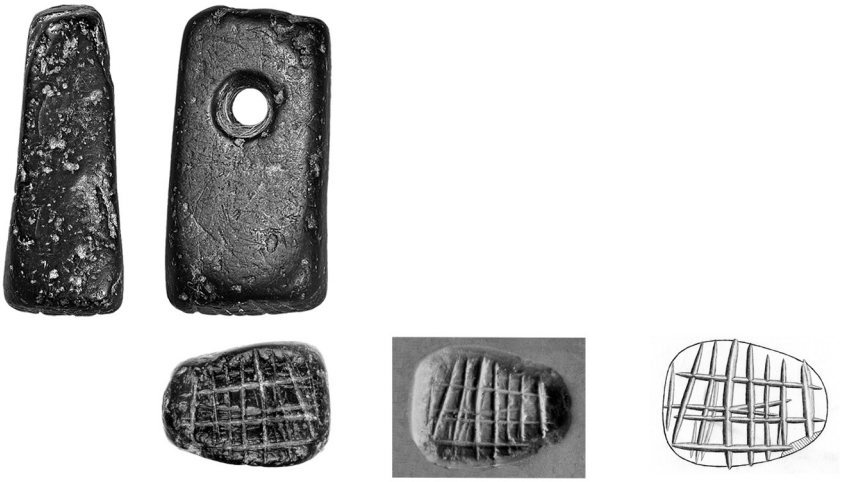
S2/Akrotiri A9022

Object type	Seal, lentoid
Material	Soft stone, orange-brown
Dimensions	Ø 1.29–1.38, Th. 0.55, Hole Ø 0.16–0.18
Motif	a: pair of 'talismanic' (?) fish, *tête-bêche*; b: –
Stylistic dating	LM I
Preservation	Complete; intense wear on seal face and reverse
Findspot	Complex Alpha (A), Western Quarters, Room 3-ground level (NPP 74); from inside an ovoid pithos, near its bottom
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	6/2/2001
Bibliography	*CMS* V Suppl. 3 no. 388



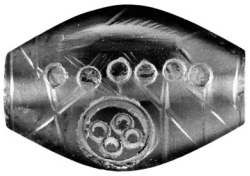
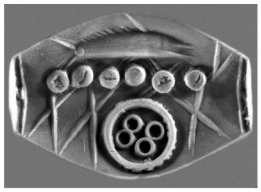
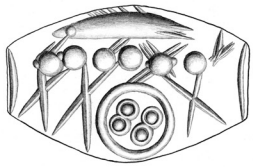
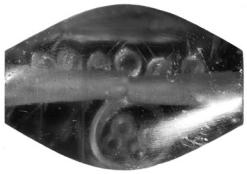
S3/Akrotiri L3139

Object type	Seal, pendant vertical plate; irregular oval, flat face
Material	Steatite, black
Dimensions	L. 1.43–1.54, W. 0.77–1.09, H. 2.73–2.95, Hole Ø 0.28–0.58
Motif	Cross-hatching
Stylistic dating	EM II–MM IA
Preservation	Complete, slight wear marks
Findspot	NPP 26NE; N of the House of the Ladies
Context dating	MC A
Provenance	Imported (?)
Retrieval date	5/3/2001
Bibliography	*CMS* V Suppl. 3 no. 386



S4/Akrotiri L3134

Object type	Seal, amygdaloid
Material	Smoky quartz, semi-transparent
Dimensions	L. 2.1, W. 1.46, Th. 0.75, Hole Ø 0.25
Motif	a: 'talismanic' (?) fish, borings, circle, centred-circles ornament, lines; b: –
Stylistic dating	MM III-early
Preservation	Complete
Findspot	NPP 67; E of Xeste 5
Context dating	MC C
Provenance	Imported
Retrieval date	10/1/2001
Bibliography	*CMS* V Suppl. 3 no. 390

S5/MPTh A4212

Object type	Seal, irregular discoid, two-sided; irregular round faces; a: flat; b: convex
Material	Steatite, brownish yellow
Dimensions	Ø 1.3–1.4, Th. 0.65, Hole Ø 0.2
Motifs	a: centred-circles ornament, hatching; b: cross-hatching
Stylistic dating	MM II–III
Preservation	Complete; a: partly worn; b: part missing
Findspot	West House, Room 5-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	21/9/1976
Bibliography	*CMS* V Suppl. 1B no. 363; Tzachili 2007a, 281–82, no. 2

S6/Akrotiri A3009

Object type	Seal, lentoid
Material	Soft stone, reddish brown
Dimensions	Ø 1.47–1.54, Th. 0.32–42, Hole Ø 0.15
Motif	a: quadruped in left profile; b: –
Stylistic dating	LM I
Preservation	Complete; a: almost completely abraded; b: well preserved
Findspot	Triangle Square; sieving of soil collected from between the House of the Anchor and the West House
Context dating	LC I (SDL)
Provenance	Imported
Retrieval date	14/9/1972
Bibliography	Televantou 1984, 16–17; Tzachili 2007a, 274, no. 1

S7/MPTh A3305

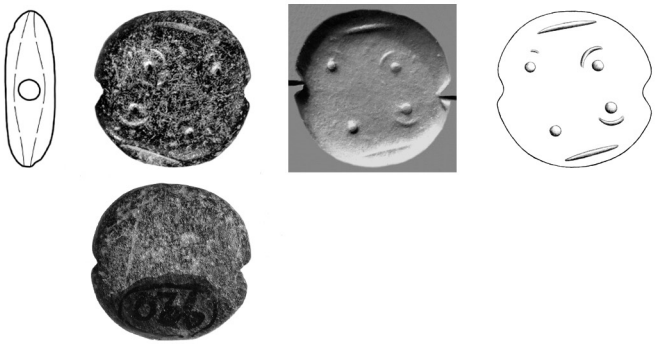
Object type	Seal (?), disc with no suspension hole; round, plano-convex face
Material	Tuff, whitish green
Dimensions	Ø 1.95, Th. 0.45
Motif	a: unintelligible design comprising wavy and straight lines and a dot; b: –
Stylistic dating	–
Preservation	Complete
Findspot	Triangle Square, debris layer near the West House
Context dating	LC I (SDL)
Provenance	Local
Retrieval date	16/9/1972
Bibliography	*CMS* V Suppl. 1B no. 362; Tzachili 2007a, 281–82, no. 1

S8/MPTh L1836

Object type	Seal, pendant vertical plate, concave-convex; crescent-shaped, flat face
Material	Tuff (?), whitish with a green hue
Dimensions	L. 1.65, W. 0.5, H. 1.6, Hole 0.35
Motif	Two oblique parallel lines
Stylistic dating	EM II–MM IA
Preservation	Complete; worn surface
Findspot	Cenotaph Square, area of PP 17
Context dating	LC I-early
Provenance	Local
Retrieval date	2/9/1993
Bibliography	Karnava 2016a, 117, fig. 8

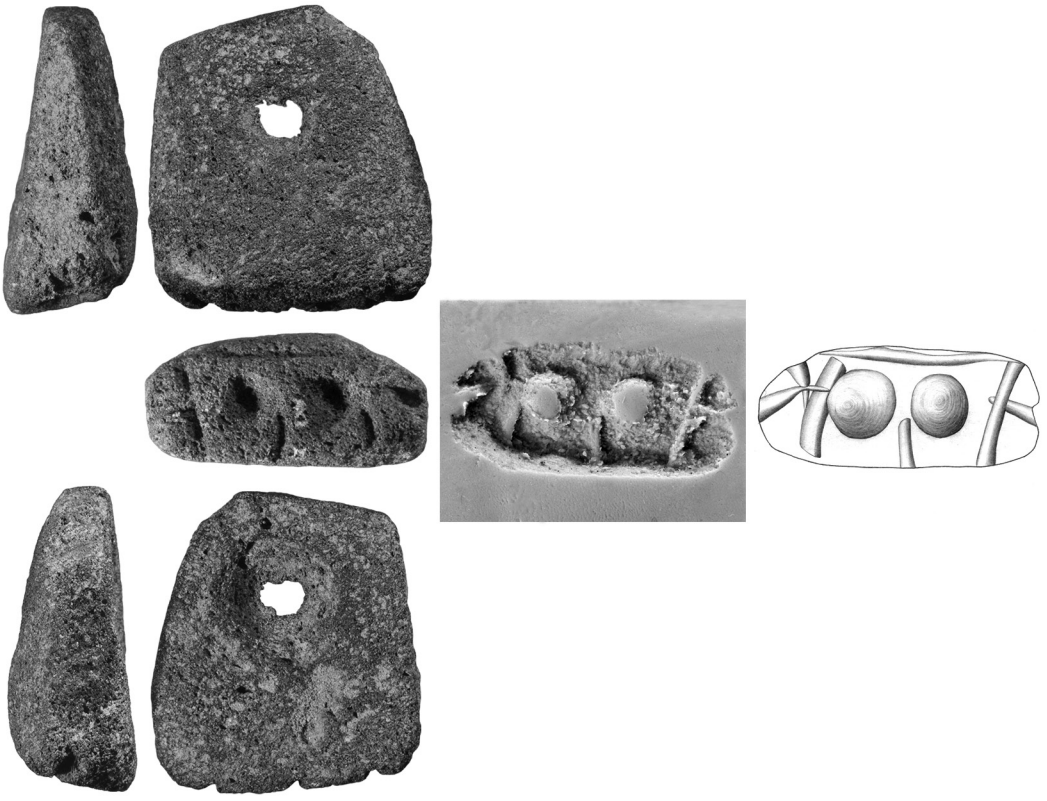
S9/MPTh A920

Object type	Seal, lentoid, disc-shaped
Material	Serpentine, dark green-black
Dimensions	Ø 1.35, Th. 0.45, Hole Ø 0.15–0.2
Motif	a: centred-circles ornament and lines; b: –
Stylistic dating	LM I
Preservation	Complete; worn motif
Findspot	Complex Delta (Δ), Delta-North, Room 4–5 (main staircase)
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	25/8/1970
Bibliography	*CMS* V Suppl. 1B no. 365



S10/MPTh L1835

Object type	Seal, pendant vertical plate; oval, flat face
Material	Volcanic stone, hard porous, black
Dimensions	L. 2.3–2.45, W. 0.65–1.15, H. 2.7, Hole Ø 0.35
Motif	Borings and lines
Stylistic dating	–
Preservation	Complete
Findspot	Complex Delta (Δ), Delta-West, Room 1a-ground level
Context dating	LC I (VDL) (or earlier)
Provenance	Local
Retrieval date	25/8/1993
Bibliography	Papadimitriou-Grammenou 2008, 146, fig. 15



S11/MPTh A3752

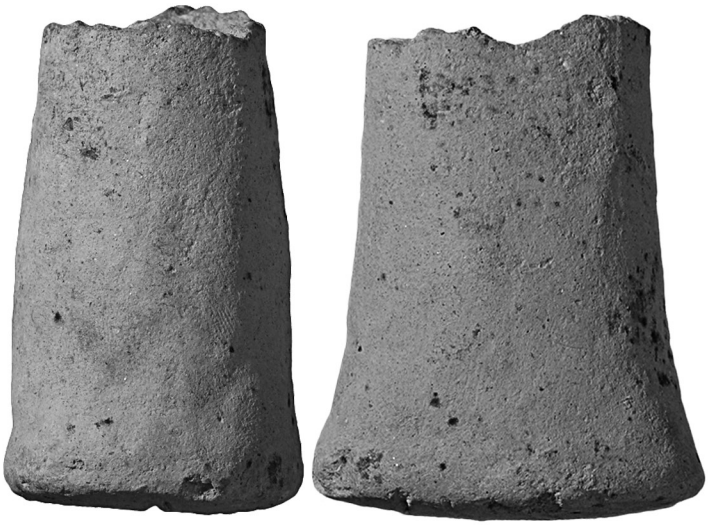
Object type	Seal, lentoid
Material	Serpentine, dark green-grey
Dimensions	Ø 1.65–1.75, Th. 0.65, Hole Ø 0.25–0.3
Motif	a: 'talismanic' spray motif with centred-circles; b: –
Stylistic dating	LM I
Preservation	Complete
Findspot	Complex Delta (Δ), Delta-West, Room 9.1-ground floor
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	15/9/1973
Bibliography	*Thera* VII, 32, pl. 57b; Onassoglou 1985, pl. XIV2; *CMS* V Suppl. 1B no. 364

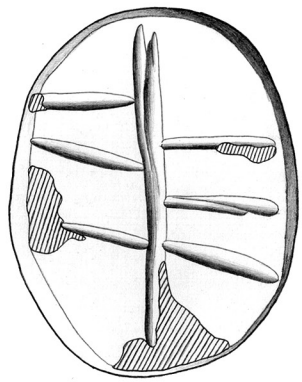
S12/MPTh A2838

Object type	Seal, lentoid
Material	Jasper, brown-red
Dimensions	Ø 1.4, Th. 0.55, Hole Ø 0.15
Motif	a: sphinx in right profile and dolphin under its belly; b: –
Stylistic dating	LM I
Preservation	Complete
Findspot	Complex Delta (Δ), Delta-South, Room 16
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	23/9/1971
Bibliography	*Ergon* 1971, 204, 206, fig. 250; Thera V, 36, pl. 85a, b; *CMS* V no. 690

S13/MPTh A3588

Object type	Stamp seal; oval, flat face
Material	Clay, yellowish
Dimensions	L. 3.6, W. 2.7, H. 4.5
Motif	A line divides the face longitudinally and from either side of it emanate three short lines
Stylistic dating	–
Preservation	Complete except for missing handle
Findspot	Square of the Benches
Context dating	LC I (VDL)
Provenance	Local
Retrieval date	23/8/1973
Bibliography	*Thera* VII, 32, pl. 56d; *CMS* V Suppl. 1B no. 361



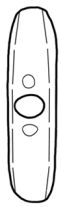


S14/Akrotiri A6383

Object type	Seal, disc, two-sided
Material	Steatite, black
Dimensions	Ø 1.56–1.73, Th. 0.26–0.39, Hole Ø 0.3
Motif	a: human (male) figure (?) walking in left profile, line; b: –
Stylistic dating	MM II–LM I
Preservation	Complete
Findspot	Xeste 3, Rooms 13–14
Context dating	LC I (VDL)
Provenance	Imported (?)
Retrieval date	29/6/1990
Bibliography	*Ergon* 1990, 113; *Praktika* 1990, 234, pl. 146a





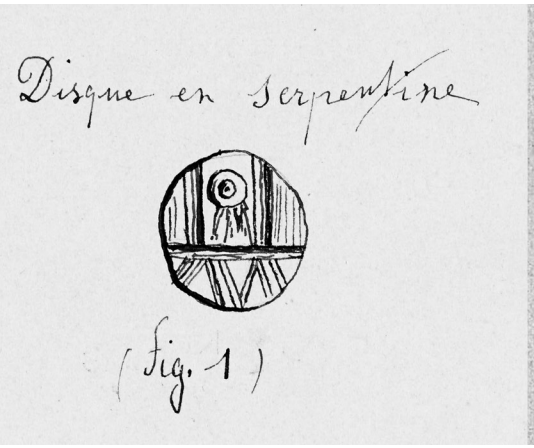


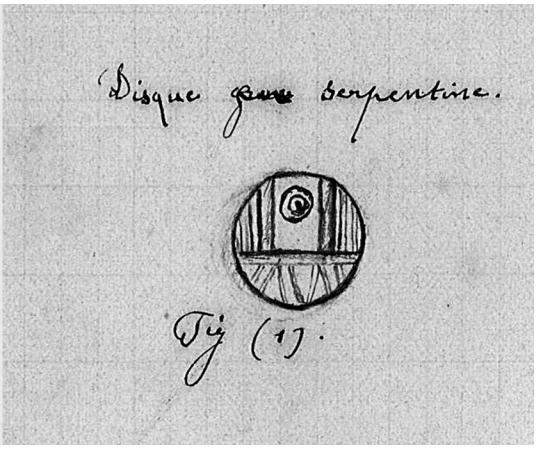
S15/Akrotiri A8385

Object type	Seal, *Petschaft*; round, convex face
Material	Calcareous material, whitish
Dimensions	Ø 1.25, H. 1.15, Hole Ø 0.26
Motif	'Star of David'; cross-hatching in the background (abraded)
Stylistic dating	MM II
Preservation	Complete, with biological residues; surface overall corroded due to contact with volcanic depositions
Findspot	Building Iota Beta (IB) (NPP 44A)
Context dating	MC D–LC I-early
Provenance	Imported
Retrieval date	17/2/2000
Bibliography	*CMS* V Suppl. 3 no. 387

S16

Object type	Seal, lentoid, discoid or disc
Material	'Serpentine'
Dimensions	Ø 1.3
Motif	a: 'talismanic' and/or 'tectonic' ornament with a centred-circle; b: –
Stylistic dating	LM I
Preservation	–
Findspot	Unexcavated building to the E of the House of the Ladies
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	1870
Bibliography	*Fouqué 1879, 112; Karnava 2014b, 49, no. 42*; *Karnava 2016a, 113, fig. 1* (*Mémoire de MM. Gorceix et Mamet © bpk-RMN-Grand Palais/Mathieu Rabeau/ Paris, Académie des Inscriptions et Belles Lettres; Manuscrits de l'université de Nancy/UL, Emile Burnouf 45*)

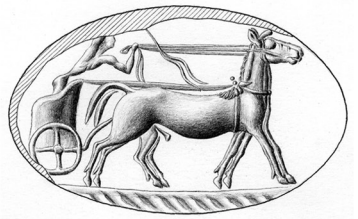


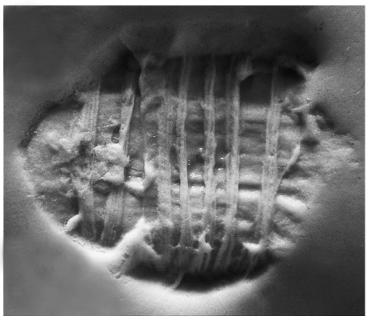


NODULES

N1/MPTh A8888

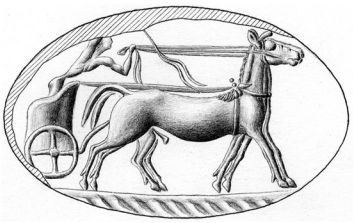
Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.95, W. 2.4, H. 0.5
Seal impression	Signet ring; gold; chariot scene; L pres. 2.7, W pres. 2
Leather impression	L. pres. 2.9, W. pres. 1.7
Strings around leather	Perpendicular to the seal impression; W. 0.03
Stylistic dating (seal)	LM I
Preservation	Almost perfectly preserved; joined from three pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 1; *CMS* V Suppl. 3 no. 391

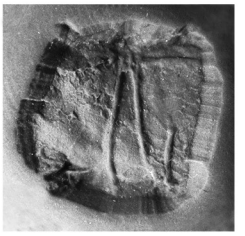




N2/Akrotiri A8889

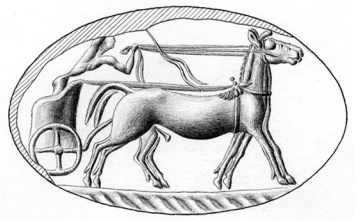
Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.6, W. pres. 1.75, H. 0.75
Seal impression	Signet ring; gold; chariot scene; L. pres. 1.4, W. pres. 1.65
Leather impression	L. pres. 1.4, W. pres. 1.35
Strings around leather	Perpendicular to the seal impression; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Partially preserved (half); one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 2; *CMS* V Suppl. 3 no. 391





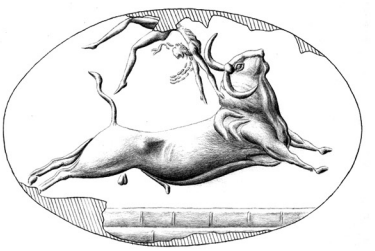
N3/MPTh A8890

Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 3.15, W. 2, H. 0.8
Seal impression	Signet ring; gold; chariot scene; L. pres. 2.75, W. pres. 1.9
Leather impression	L. 2.8, W. pres. 1.7
Strings around leather	Perpendicular to the seal impression; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Almost perfectly preserved; joined from two pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 3; *CMS* V Suppl. 3 no. 391



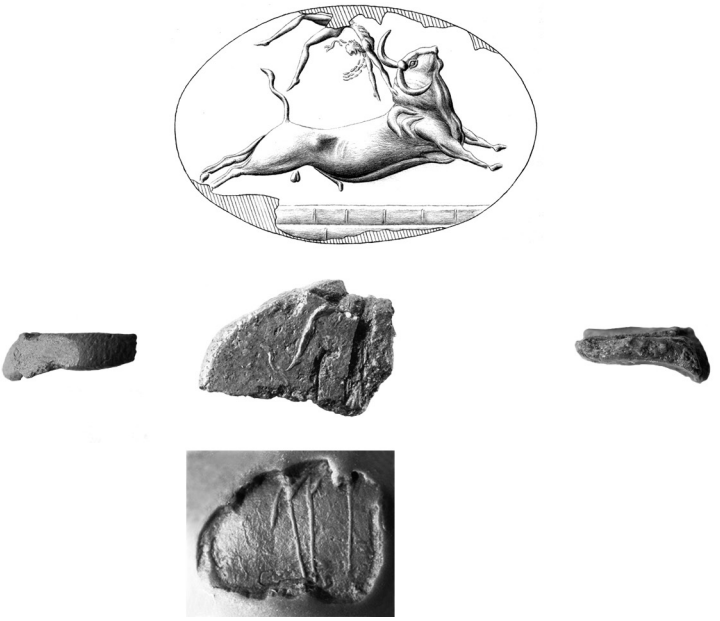
N4/Akrotiri A8915 + A11683

Object type	Flat-based nodule, one-seal (?)
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2.4, W. pres. 1.4, H. pres. 0.9
Seal impression	Signet ring; gold; bull-leaping scene; L. pres. 2, W. pres. 1.3
Leather impression	Unique: clay folded over side (?) of leather that consists of two curved surfaces; L. pres. 2.1, W. pres. 1.2, H. 0.35; curved surfaces Th. 0.35 each
Strings around leather	Perpendicular to the seal impression; W. 0.03
Stylistic dating (seal)	LM I
Preservation	Small part preserved; joined from three pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 32 + 68 + 73; *CMS* V Suppl. 3 no. 392



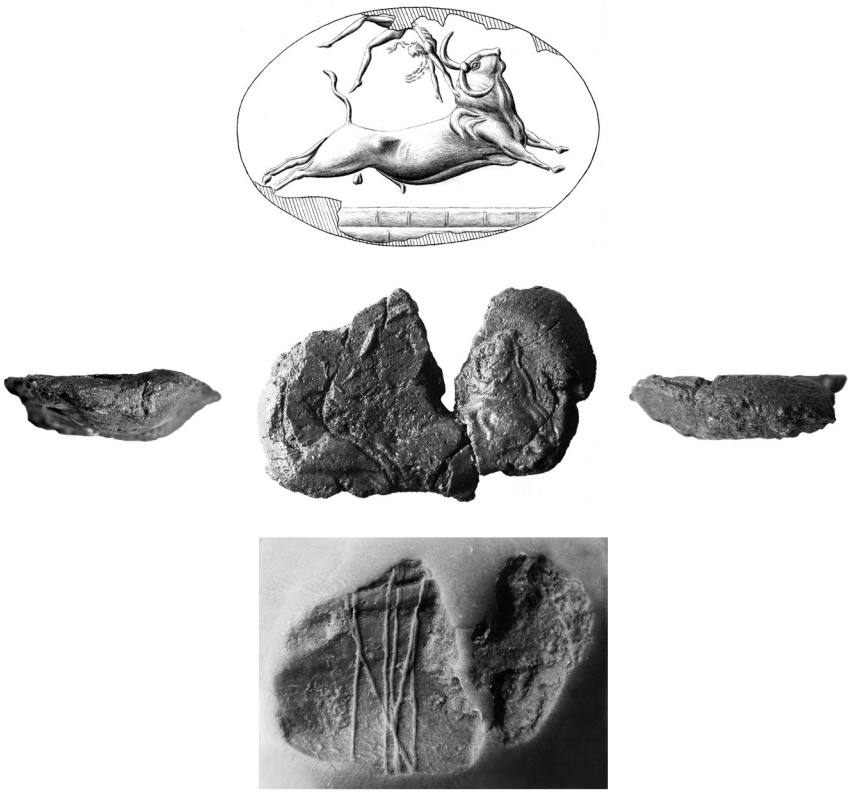
N5/Akrotiri A8919

Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; yellowish-brown
Clay paste	B
Dimensions	L. pres. 1.85, W. pres. 1.25, H. 0.35
Seal impression	Signet ring; gold; bull-leaping scene; L. pres. 1.3, W. pres. 1.05
Leather impression	L. pres. 1.55, W. pres. 1
Strings around leather	Perpendicular to the seal impression; W. 0.03
Stylistic dating (seal)	LM I
Preservation	Small part preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 36; *CMS* V Suppl. 3 no. 392



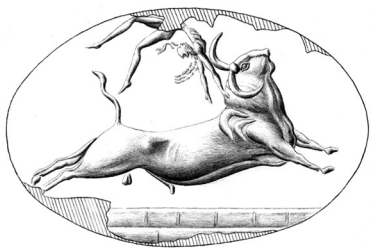
N6/Akrotiri A8920

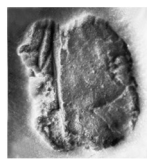
Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; yellowish-brown
Clay paste	B
Dimensions	L. 3, W. pres. 1.9, H. 0.5
Seal impression	Signet ring; gold; bull-leaping scene; L. pres. 2.55, W. pres. 1.9
Leather impression	L. pres. 2.6, W. pres. 1.9
Strings around leather	Perpendicular to the seal impression; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Almost perfectly preserved; joined from two pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 37 + 40; *CMS* V Suppl. 3 no. 392



N7/Akrotiri A8923

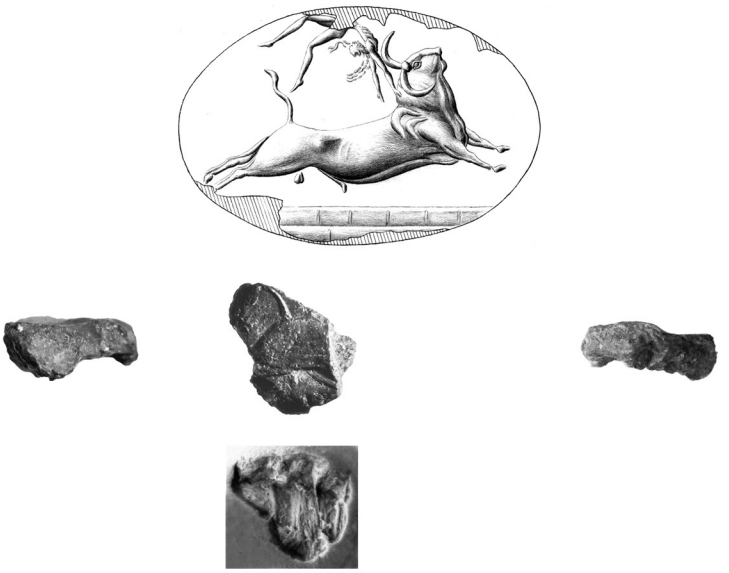
Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; yellowish-brown
Clay paste	B
Dimensions	L. pres. 0.9, W. pres. 1.3, H. pres. 0.35
Seal impression	Signet ring; gold; bull-leaping scene; L. pres. 0.8, W. pres. 1.05
Leather impression	L. pres. 0.9, W. pres. 1.1
Strings around leather	Perpendicular to the seal impression; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Very small part preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 41; *CMS* V Suppl. 3 no. 392





N8/Akrotiri A8924

Object type	Flat-based nodule, one-seal (?)
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 0.9, W. pres. 1.2, H. pres. 0.4
Seal impression	Signet ring; gold; bull-leaping scene; L. pres. 1.05, W. pres. 0.8
Leather impression	L. pres. 0.9, W. pres. 0.6
Strings around leather	Perpendicular to the seal impression; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Very small part preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 42; *CMS* V Suppl. 3 no. 392

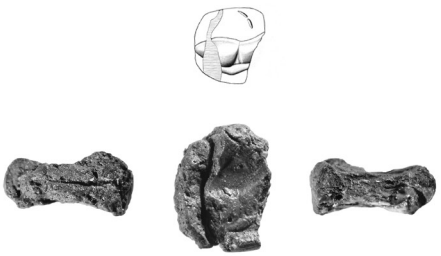


N9/Akrotiri A8941

Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 2.55, W. 1.3, H. 0.6
Seal impression	Signet ring; gold; scene at a tree; L. pres. 1.3, W. pres. 1.4
Leather impression	L 1.8, W. 1
Strings around leather	Parallel to the seal impression; W. 0.03
Stylistic dating (seal)	LM I
Preservation	Almost perfectly preserved; joined from two pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 61; *CMS* V Suppl. 3 no. 400

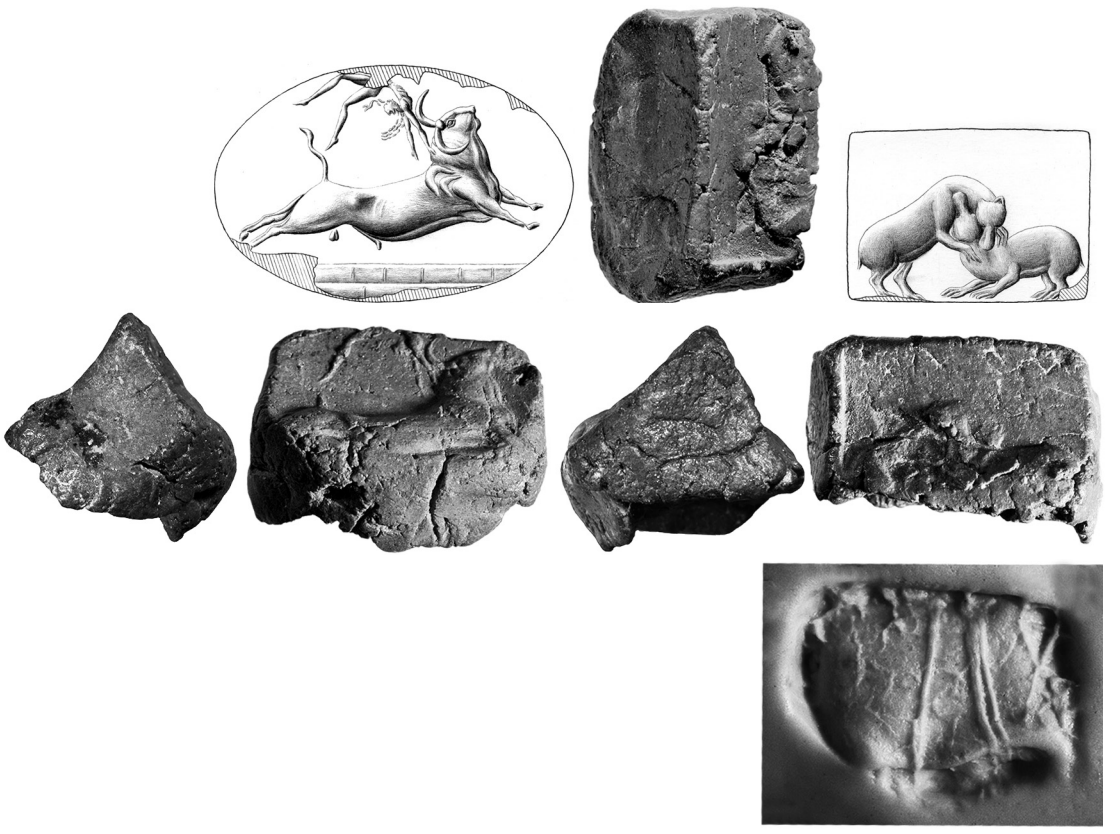
N10/Akrotiri A11679

Object type	Flat-based nodule, one-seal
Material	Clay, unfired; finely gritted; brown-red
Clay paste	A (?)
Dimensions	L. pres. 0.85, W. pres. 1.15, H. pres. 0.5
Seal impression	Signet ring (?); metal (?); part of an animal's body; L. pres. 0.6, W. pres. 0.95
Leather impression	L. pres. 0.8, W. pres. 0.9
Strings around leather	(Probably) perpendicular to the seal impression; W. 0.06
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 69



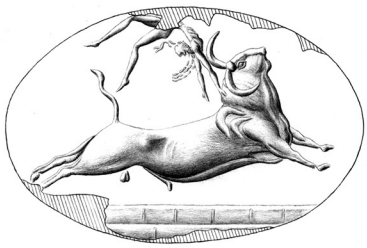
N11/MPTh A8891

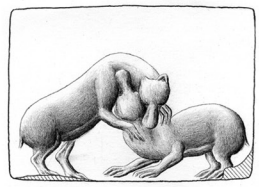
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.65, W. 2, H. 1.5
Seal impression a	Signet ring; gold; bull-leaping scene; L. 2.4, W. 1.7
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.15, W. pres. 1.5
Leather impression	L. 2.2, W. pres. 1.6
Strings around leather	Perpendicular to the seal impressions; W. 0.04
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 4; *CMS* V Suppl. 3 nos. 392, 393

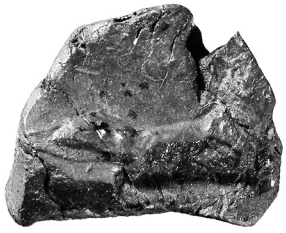


N12/Akrotiri A8892 + A11694 + A11696

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2.45, W. pres. 1.35, H. 1.8
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.9, W. pres. 1.65
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.75, W. pres. 1.1
Leather impression	L. pres. 2.1, W. pres. 1.2
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Possibly joining with N67
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 5 + 86 + 89; *CMS* V Suppl. 3 nos. 392, 393

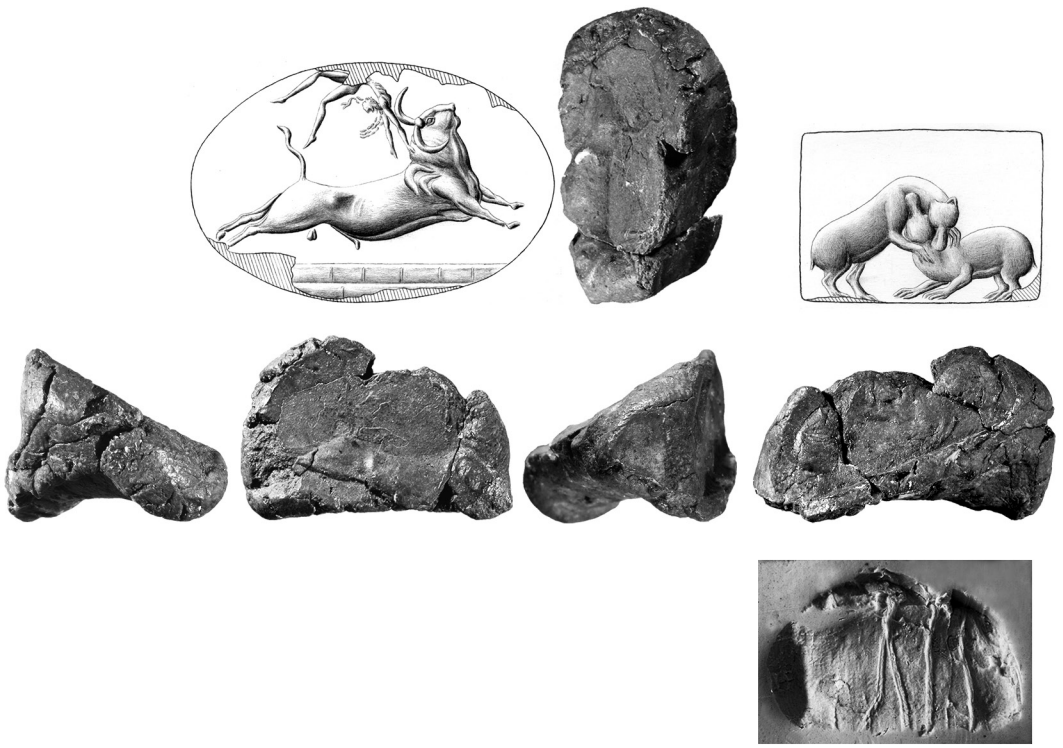






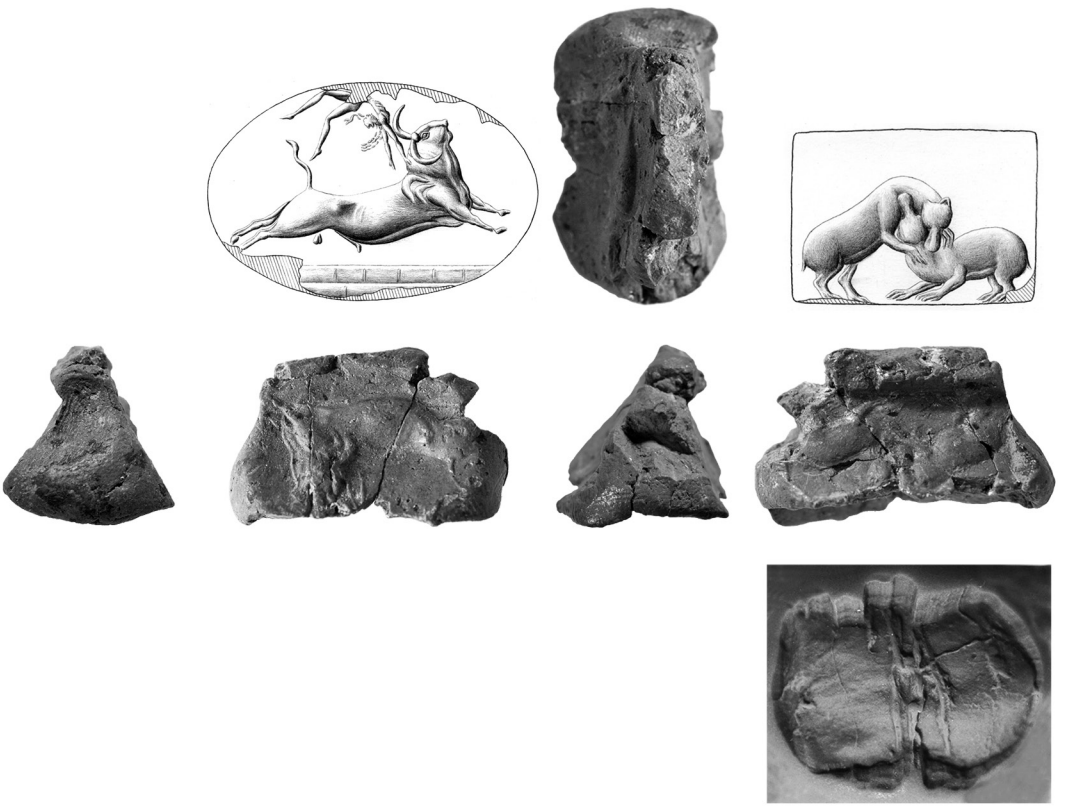

N13/Akrotiri A8893 + A11691

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.65, W. 1.7, H. 1.6
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.35, W. pres. 1.75
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.15, W. pres. 0.9
Leather impression	L. 2.2, W. 1.4
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from two pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 6 + 82 + 87; *CMS* V Suppl. 3 nos. 392, 393



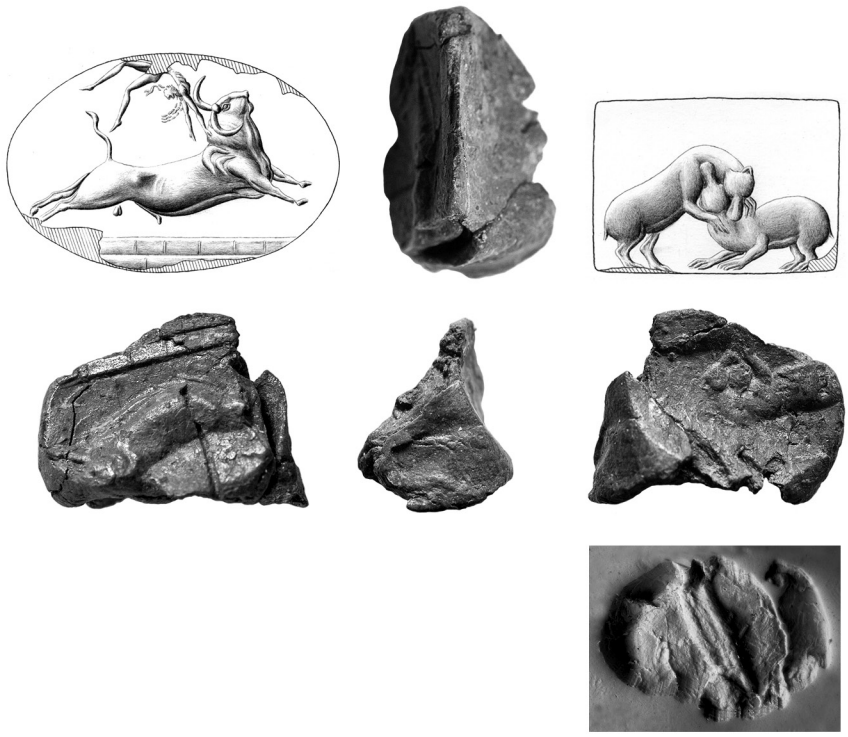
N14/Akrotiri A8894

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.7, W. 1.65, H. 1.73
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.2, W. pres. 1.6
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.05, W. pres. 1.05
Leather impression	L. 2.35, W. pres. 1.55
Strings around leather	Perpendicular to the seal impressions, possible knot; W. 0.075
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from at least three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 7; *CMS* V Suppl. 3 nos. 392, 393



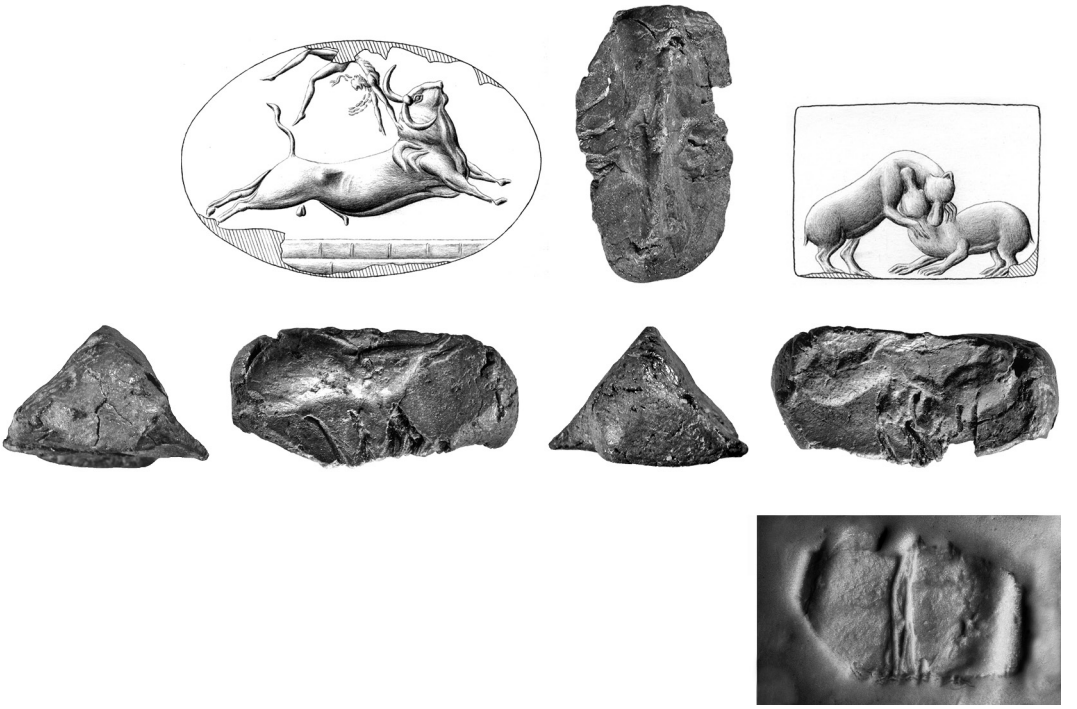
N15/Akrotiri A8895 + A11681

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.4, W. 1.55, H. 1.7
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.8, W. pres. 1.65
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2, W. pres. 1.6
Leather impression	L. 2, W. 1.45
Strings around leather	Perpendicular (and slightly oblique) to the seal impressions; W. 0.09
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 8 + 71; *CMS* V Suppl. 3 nos. 392, 393



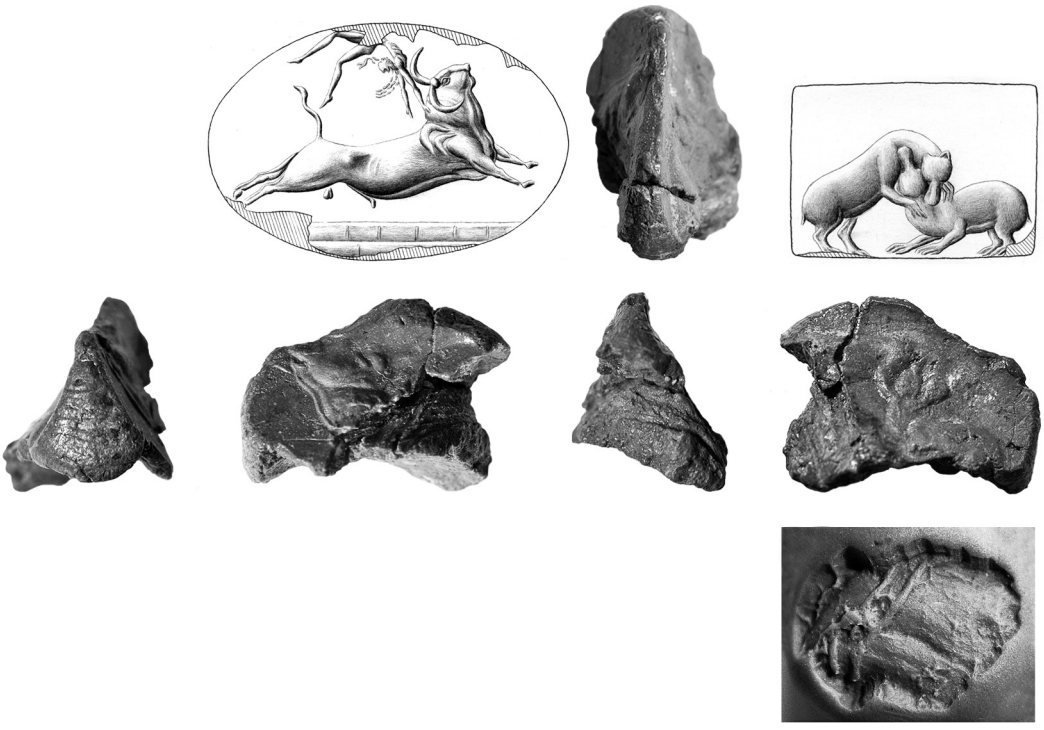
N16/MPTh A8896

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.55, W. pres. 1.4, H. 0.95
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.25, W. pres. 1.2
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.2, W. pres. 1.1
Leather impression	L. 2.1, W. 1.3
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from at least three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 9; *CMS* V Suppl. 3 nos. 392, 393



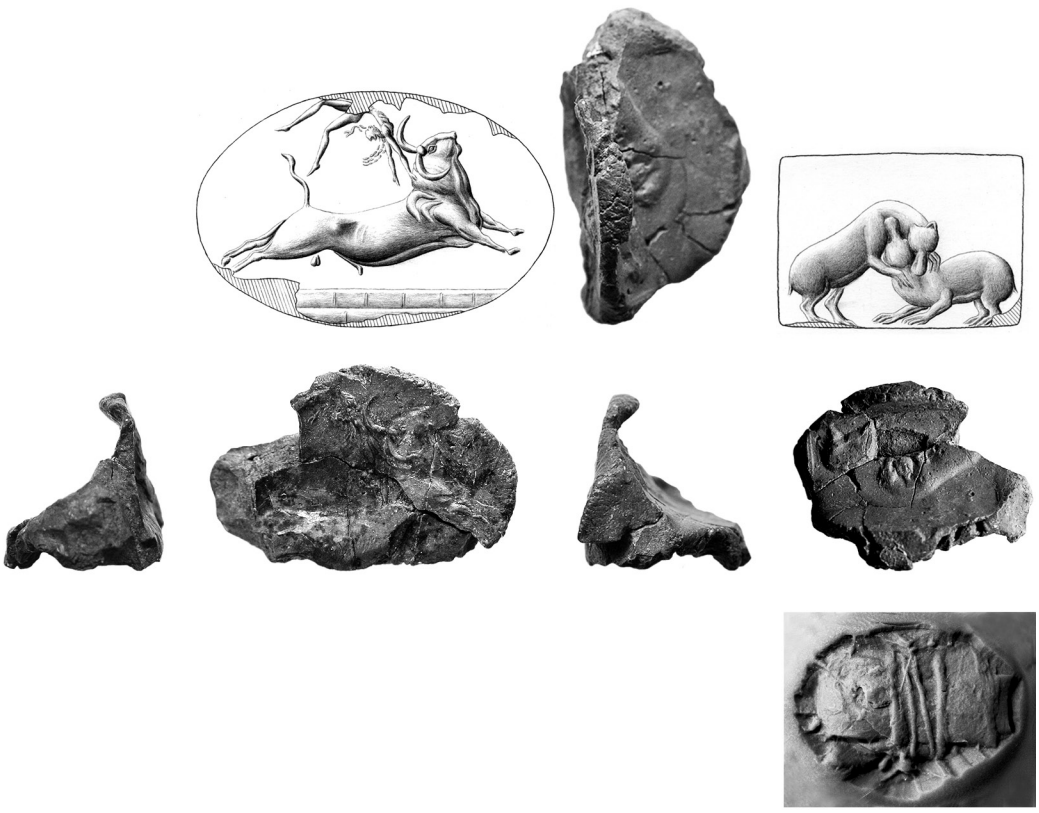
N17/Akrotiri A8897

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2.3, W. pres. 1.25, H. 1.3
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2, W. pres. 1.35
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2, W. pres. 1.5
Leather impression	L. pres. 1.75, W. pres. 1.1
Strings around leather	Perpendicular (and slightly oblique) to the seal impressions; W. 0.1
Stylistic dating (seals)	LM I
Preservation	Partially preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 10; *CMS* V Suppl. 3 nos. 392, 393



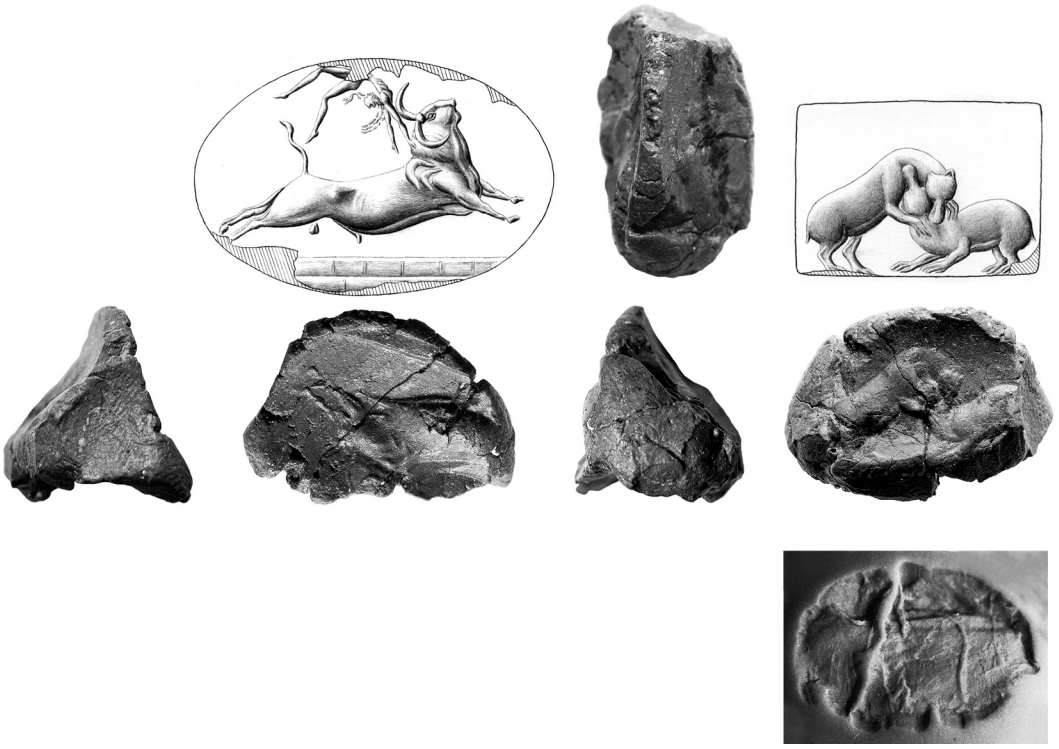
N18/Akrotiri A8898

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2.75, W. pres. 1.7, H. 1.6
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.3, W. pres. 1.7
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. 2.15, W. 1.45
Leather impression	L. 2.05, W. 0.95
Strings around leather	Perpendicular to the seal impressions; W. 0.1
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from at least three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 11 + 27; *CMS* V Suppl. 3 nos. 392, 393



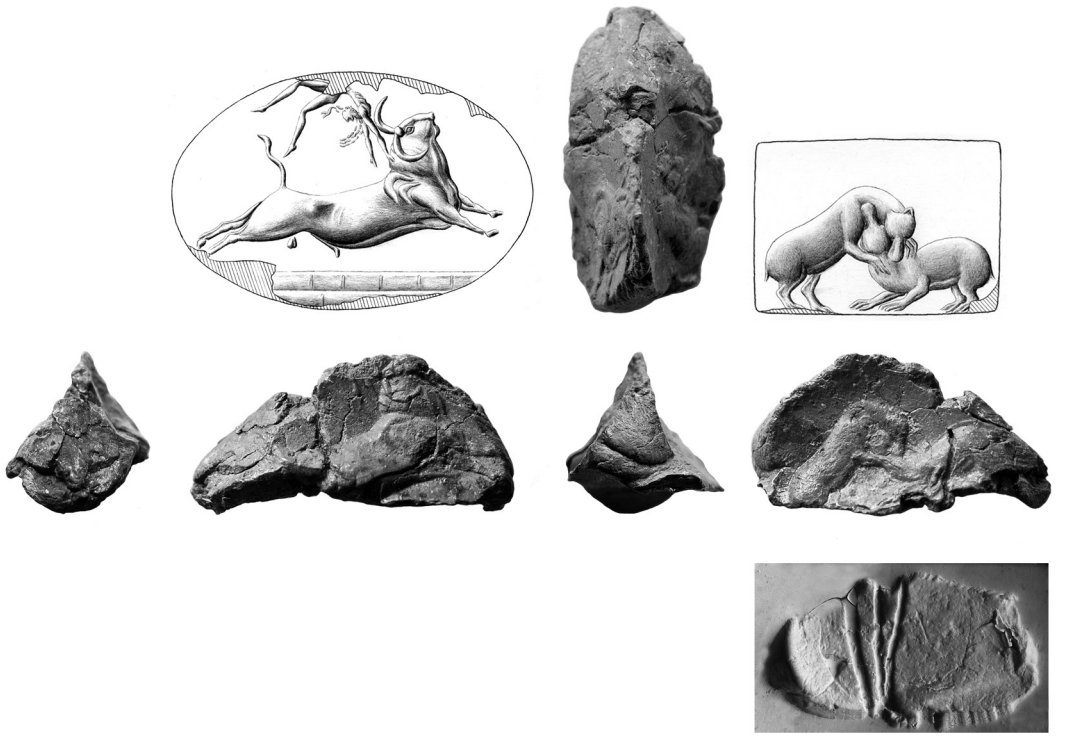
N19/Akrotiri A8899

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.45, W. 1.6, H. 1.45
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2, W. pres. 1.6
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.8, W. pres. 1.3
Leather impression	L. pres. 2.15, W. pres. 1.05
Strings around leather	Trace of one, loose string; traces of remaining strings are probably in the interior; W. 0.07
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from two pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 12 + 24; *CMS* V Suppl. 3 nos. 392, 393



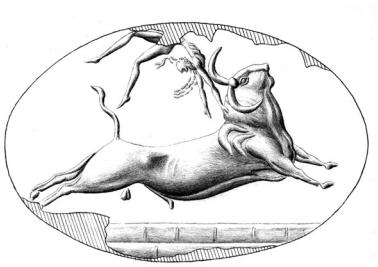
N20/Akrotiri A8900

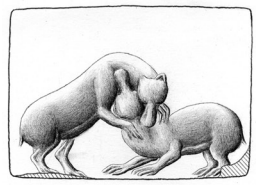
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.85, W. 1.5, H. 1.35
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.15, W. pres. 1.4
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.15, W. pres. 1.6
Leather impression	L. 2.4, W. pres. 1.5
Strings around leather	Perpendicular to the seal impressions, strings of varying thickness; W. 0.05–0.1
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from two pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 13; *CMS* V Suppl. 3 nos. 392, 393



N21/Akrotiri A8901

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.55, W. 1.2, H. 1
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.2, W. pres. 1.3
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2, W. pres. 1.1
Leather impression	L. 2.3, W. 0.9
Strings around leather	Perpendicular to the seal impressions; W. 0.07
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 14; *CMS* V Suppl. 3 nos. 392, 393

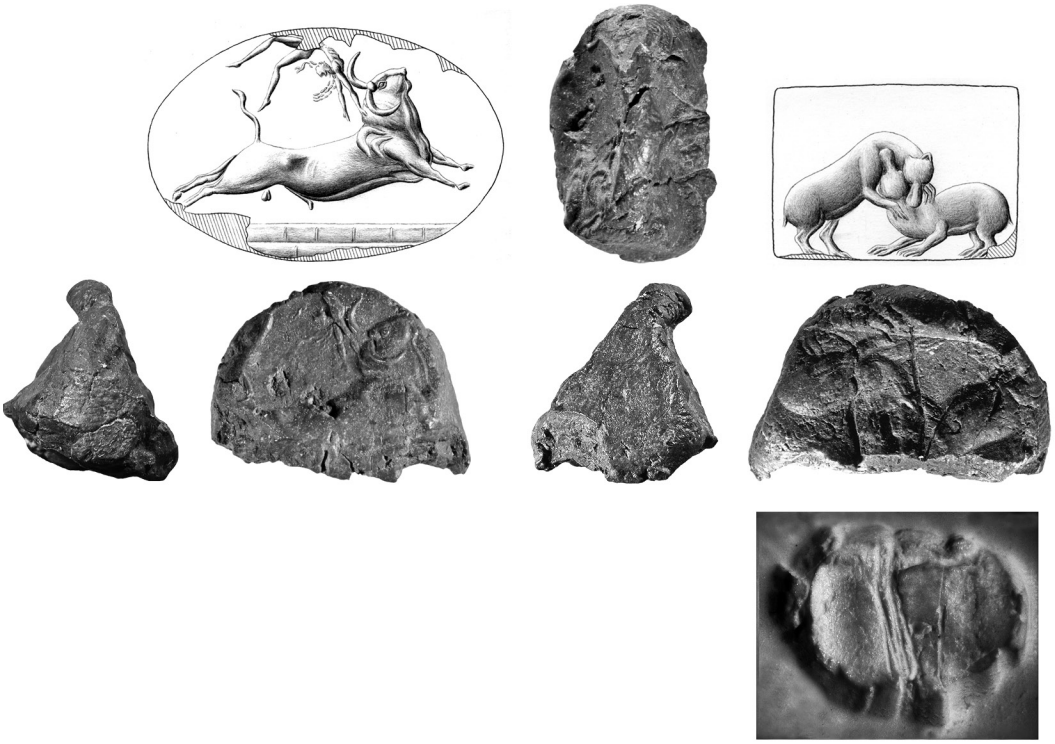






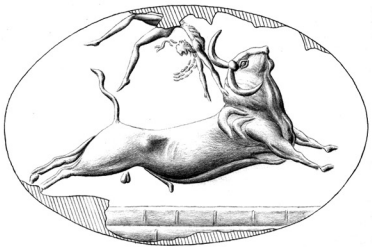

N22/Akrotiri A8902

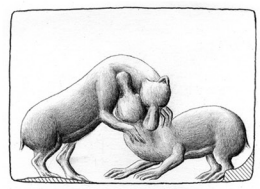
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.3, W. 1.45, H. 1.4
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.85, W. pres. 1.7
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.8, W. pres. 0.9
Leather impression	L. 1.8, W. 1.2
Strings around leather	Perpendicular to the seal impressions; W. 0.02
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 15; *CMS* V Suppl. 3 nos. 392, 393

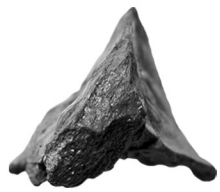


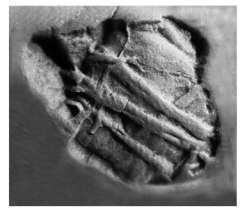
N23/Akrotiri A8903

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2.2, W. 1.6, H. 1.15
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.75, W. pres. 1.45
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.9, W. pres. 1.4
Leather impression	L. 1.2, W. 1.2
Strings around leather	Perpendicular (and slightly oblique) to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from four pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 16 + 29; *CMS* V Suppl. 3 nos. 392, 393



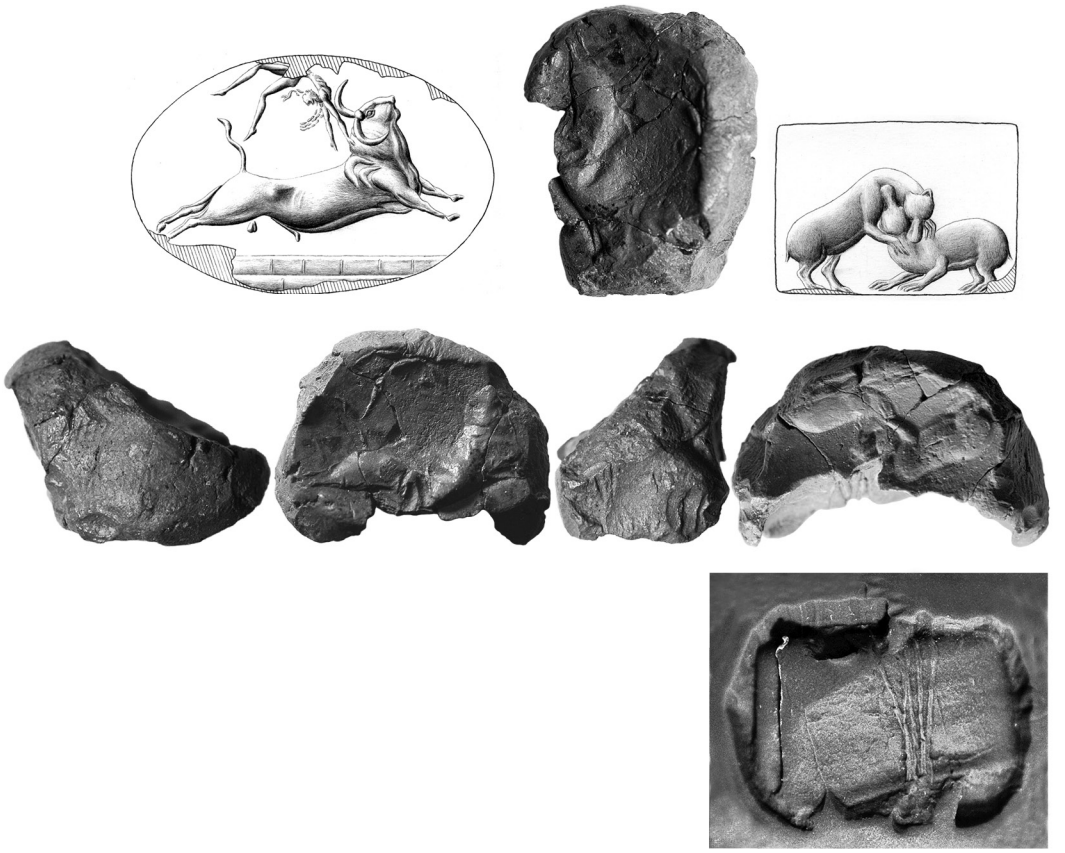




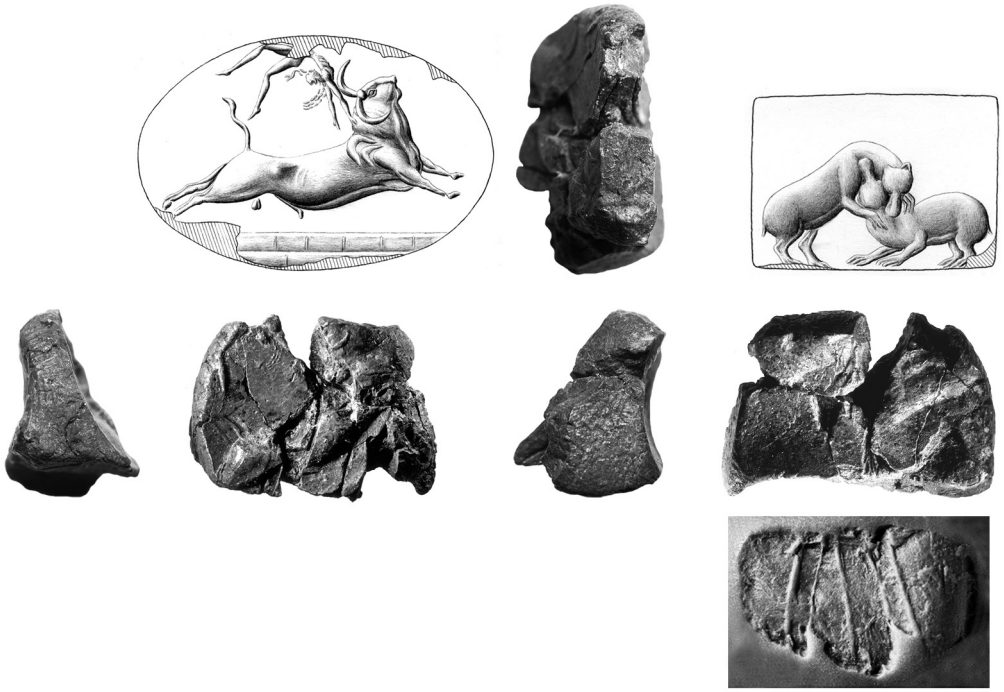
N24/Akrotiri A8904 + A11688

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.9, W. 1.7, H. 1.2–1.8
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.35, W. pres. 1.75
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.2, W. pres. 1.2
Leather impression	L. 2.3, W. 1.5
Strings around leather	Perpendicular to the seal impressions; W. 0.02
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from four pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 17 + 21 + 79; *CMS* V Suppl. 3 nos. 392, 393



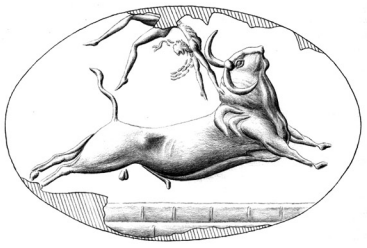
N25/Akrotiri A8905

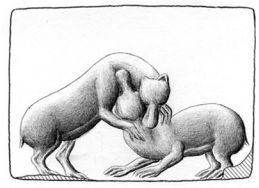
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.35, W. 1.35, H. 1.5
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.85, W. pres. 1.65
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.1, W. pres. 1.2
Leather impression	L. pres. 2, W. pres. 1.25
Strings around leather	Perpendicular to the seal impressions; W. 0.05–0.06
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from at least five pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 18; *CMS* V Suppl. 3 nos. 392, 393



N26/Akrotiri A8906 + A11678

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.6, W. 1.5, H. 1.1–1.6
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.1, W. pres. 1.65
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.7, W. pres. 1.3
Leather impression	Nodule covered the upper surface and the sides of the folded leather; L. 2.1, W. pres. 0.45, H. pres. 1.5
Strings around leather	Perpendicular to the seal impressions; W. 0.06
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 19 + 67; *CMS* V Suppl. 3 nos. 392, 393

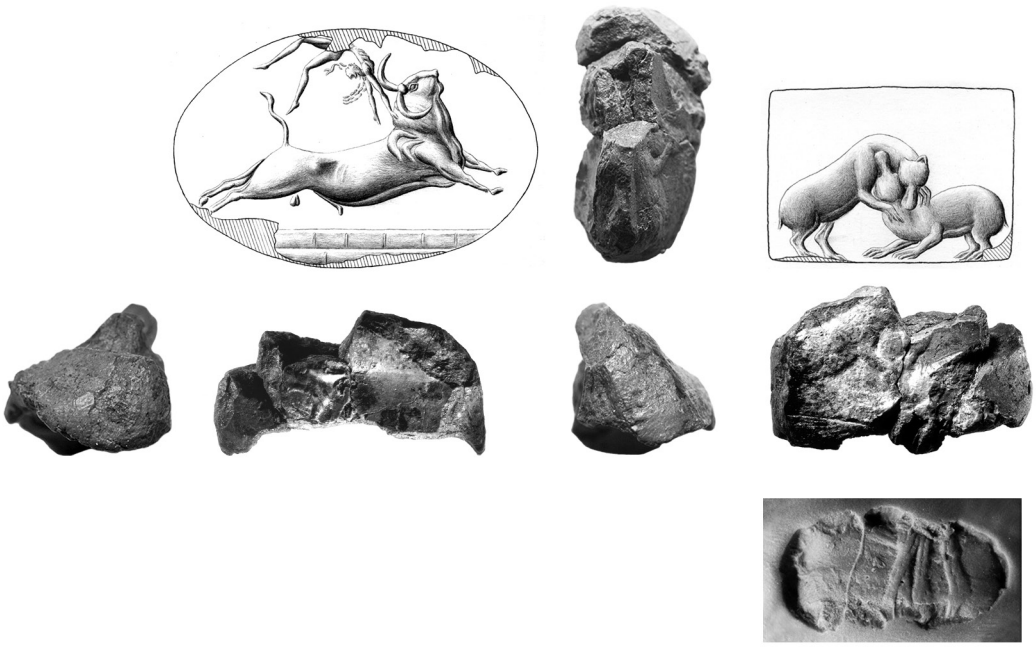






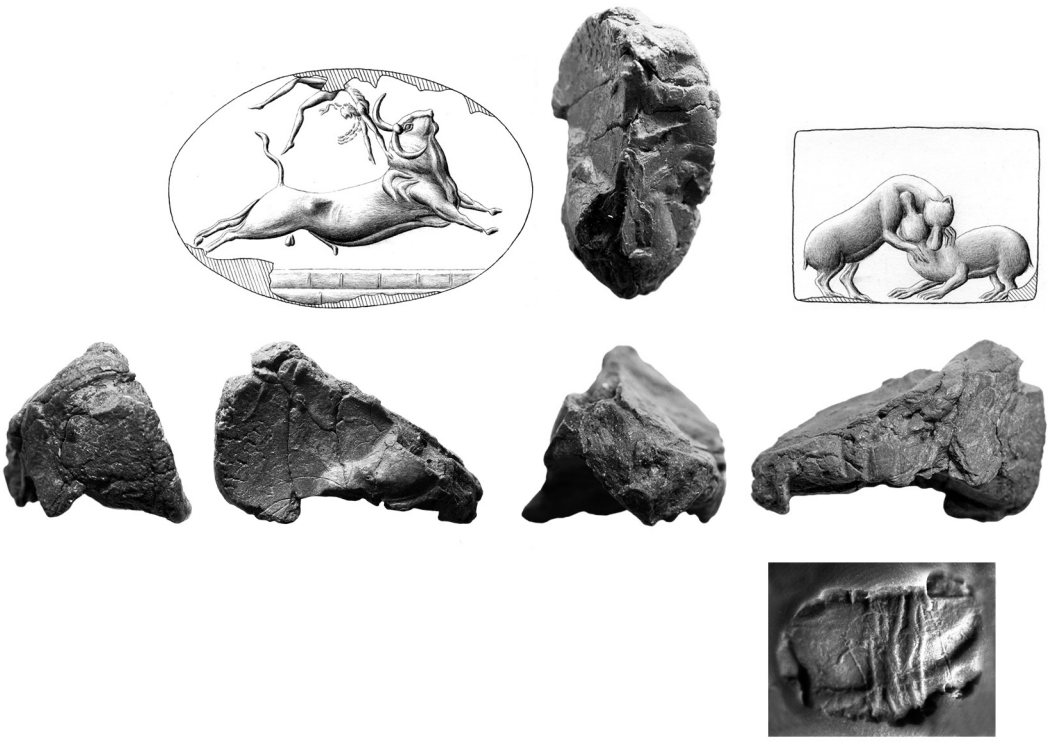

N27/Akrotiri A8907

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.3, W. 1.2, H. 0.9
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.7, W. pres. 0.9
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.7, W. pres. 1.15
Leather impression	L. 1.9, W. 0.85
Strings around leather	Perpendicular to the seal impressions; string appears to be double; W. 0.1
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 20; *CMS* V Suppl. 3 nos. 392, 393



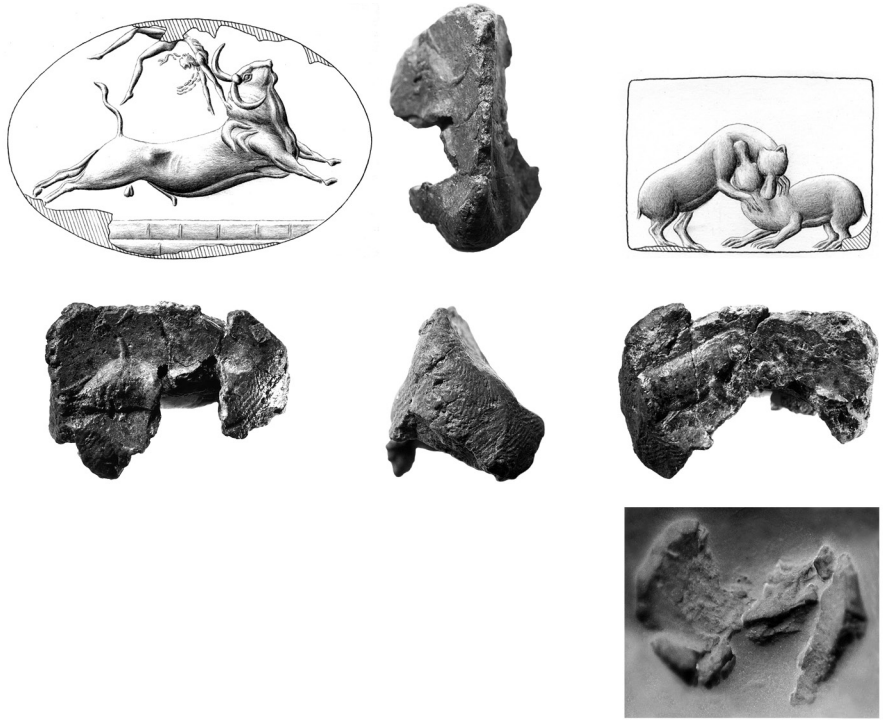
N28/Akrotiri A8908

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.6, W. 1.3, H. 1.3
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.05, W. pres. 1.45
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2.2, W. pres. 0.9
Leather impression	L. 1.85, W. 1.2
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from at least three pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 22; *CMS* V Suppl. 3 nos. 392, 393



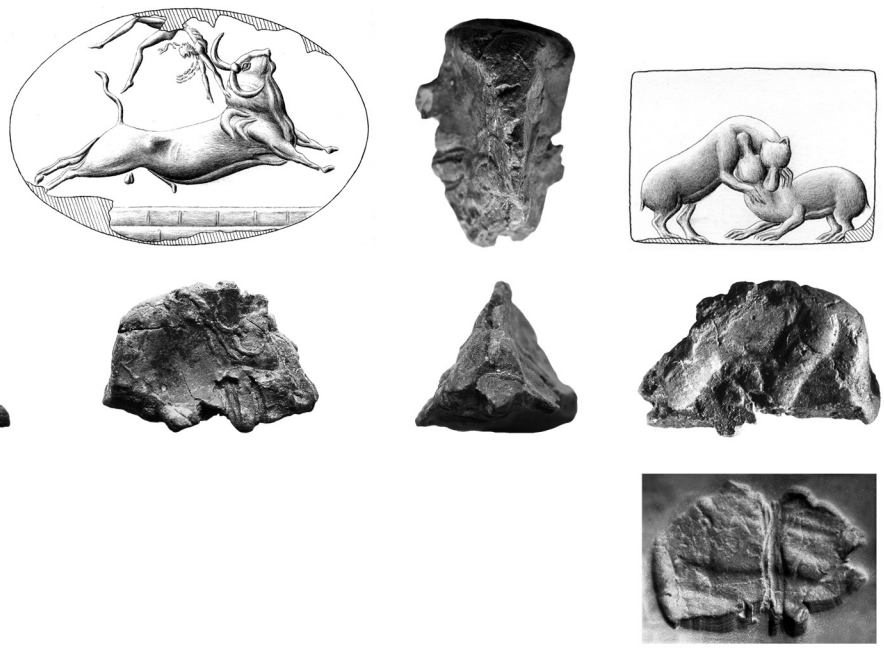
N29/Akrotiri A8909

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.2, W. pres. 1.25, H. 1.5
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.9, W. pres. 1.2
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2, W. pres. 1.15
Leather impression	Lower part missing; –
Strings around leather	Lower part missing; –
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from at least three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Could be joining with N73
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 23; *CMS* V Suppl. 3 nos. 392, 393



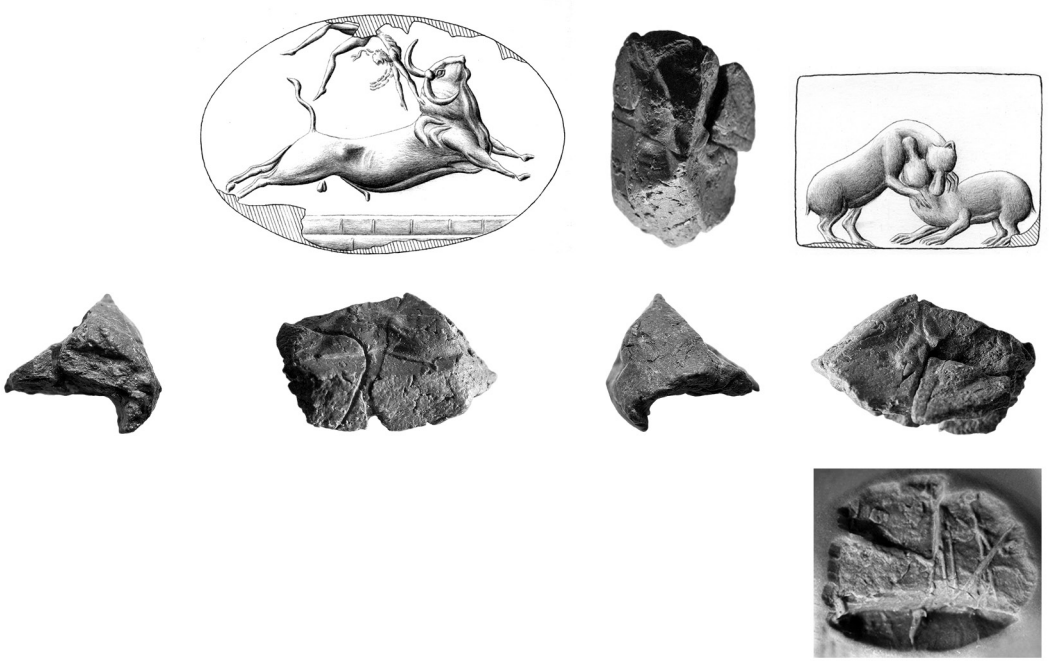
N30/Akrotiri A8910

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2.15, W. pres. 1.5, H. 1.25
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2, W. pres. 1.5
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.75, W. pres. 1.25
Leather impression	L. pres. 1.75, W. pres. 1.1
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 30; *CMS* V Suppl. 3 nos. 392, 393



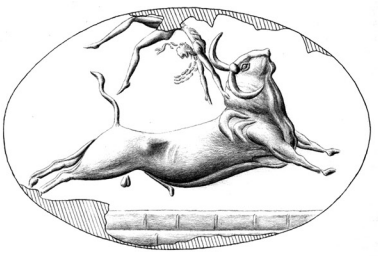
N31/Akrotiri A8911

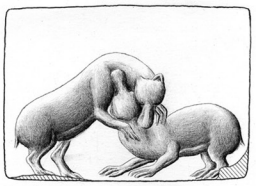
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2, W. pres. 1.4, H. 0.9
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.5, W. pres. 0.9
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.4, W. pres. 1.15
Leather impression	L. pres. 1.85, W. pres. 0.95; the clay may also have covered the side (profile) of the folded leather to a thickness of 0.25
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from at least three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 26; *CMS* V Suppl. 3 nos. 392, 393



N32/Akrotiri A8912

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.95, W. 1, H. 1.5
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.3, W. pres. 1.7
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.4, W. pres. 1.2
Leather impression	L. 1.5, W. 0.9
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from two pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 28; *CMS* V Suppl. 3 nos. 392, 393

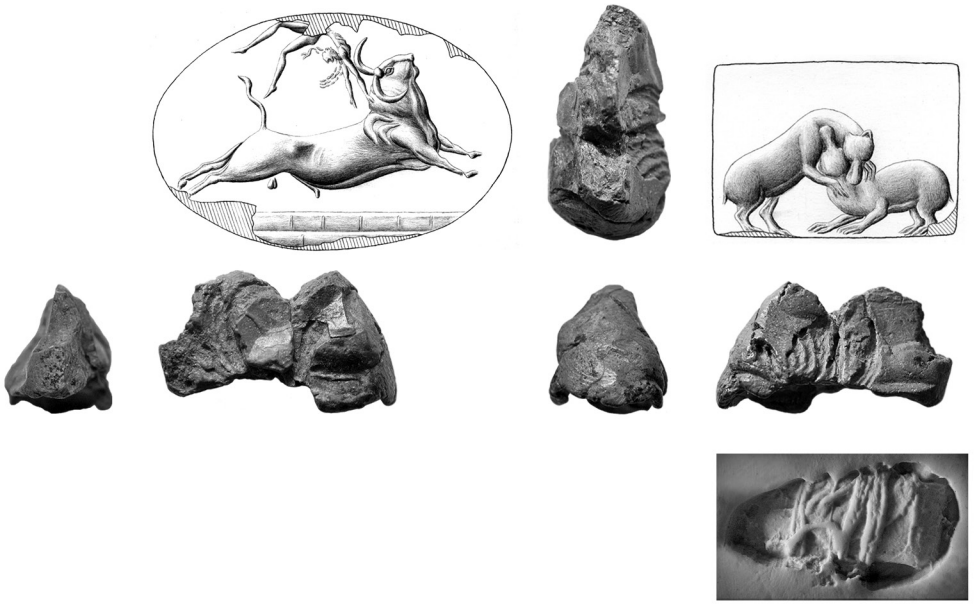






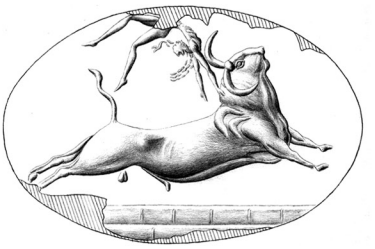

N33/Akrotiri A8913 + A11690

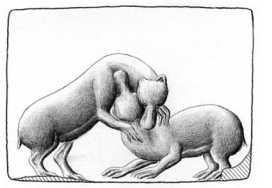
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.1, W. 1.1, H. 1.2
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.15, W. pres. 1
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.7, W. pres. 1.1
Leather impression	L. 1.9, W. 0.85
Strings around leather	Perpendicular to the seal impressions; W. 0.06–0.07
Stylistic dating (seals)	LM I
Preservation	Very small part preserved; joined from two pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 30 + 81; *CMS* V Suppl. 3 nos. 392, 393



N34/Akrotiri A8914

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.5, W. pres. 1.1, H. 0.9
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.25, W. pres. 1
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1, W. pres. 0.6
Leather impression	L. pres. 1.25, W. pres. 1
Strings around leather	Perpendicular to the seal impressions; W. 0.06
Stylistic dating (seals)	LM I
Preservation	Very small part preserved; joined from two pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 31; *CMS* V Suppl. 3 nos. 392, 393

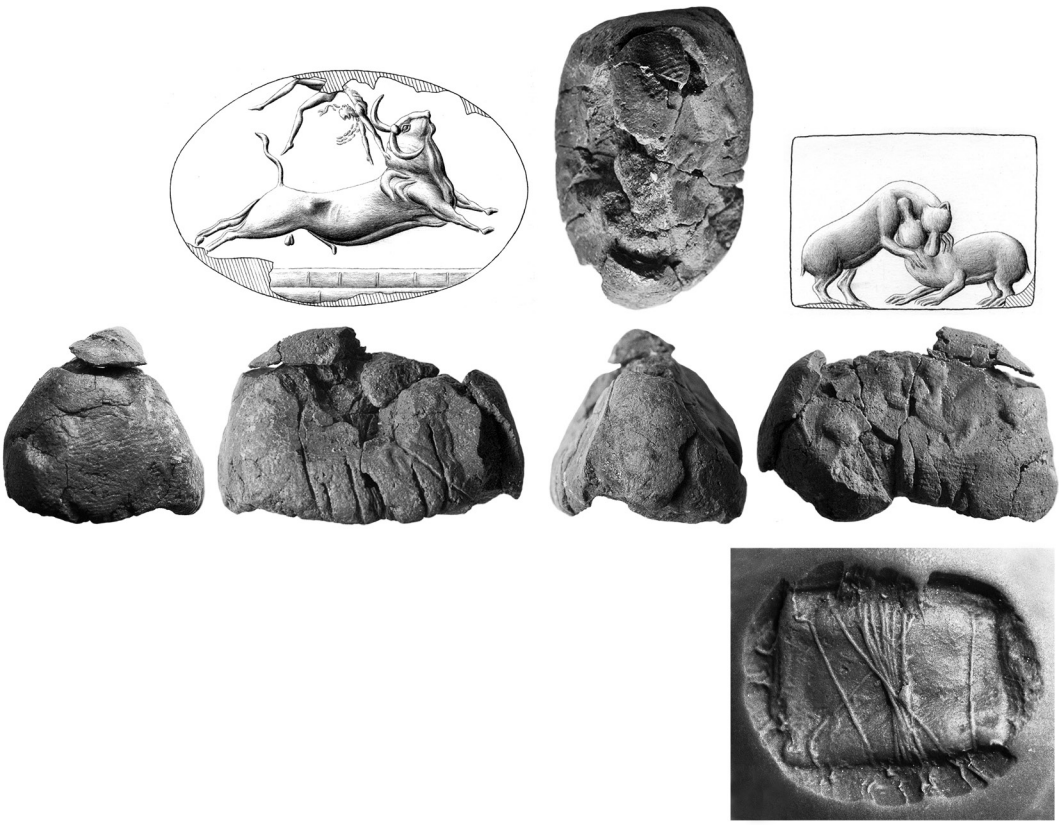






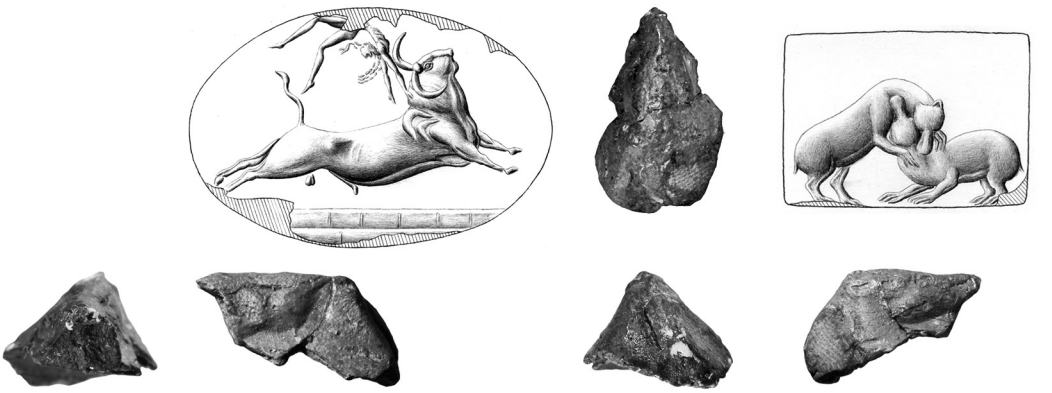

N35/Akrotiri A8916

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.7, W. 1.75, H. 1.65
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.8, W. pres. 1.1
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 2, W. pres. 1
Leather impression	L. 1.9, W. 1.3
Strings around leather	Perpendicular to the seal impressions; W. 0.03
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from at least five pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 33 + 44; *CMS* V Suppl. 3 nos. 392, 393



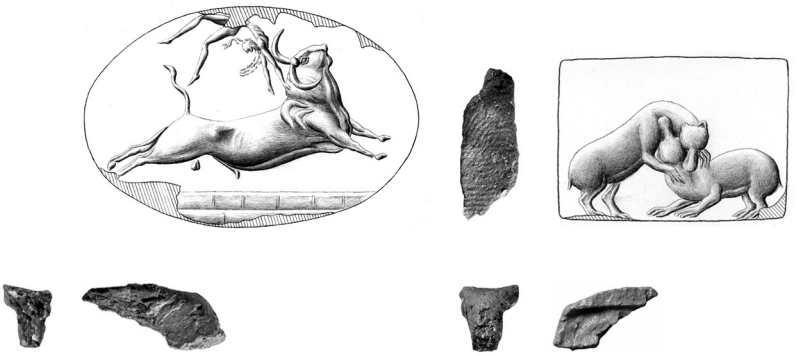
N36/Akrotiri A11680

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.8, W. pres. 1.15, H. 1
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.05, W. pres. 0.6
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.35, W. pres. 0.8
Leather impression	Not clear if it is a leather imprint or the nodule's interior
Strings around leather	–
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from two pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 70; *CMS* V Suppl. 3 nos. 392, 393



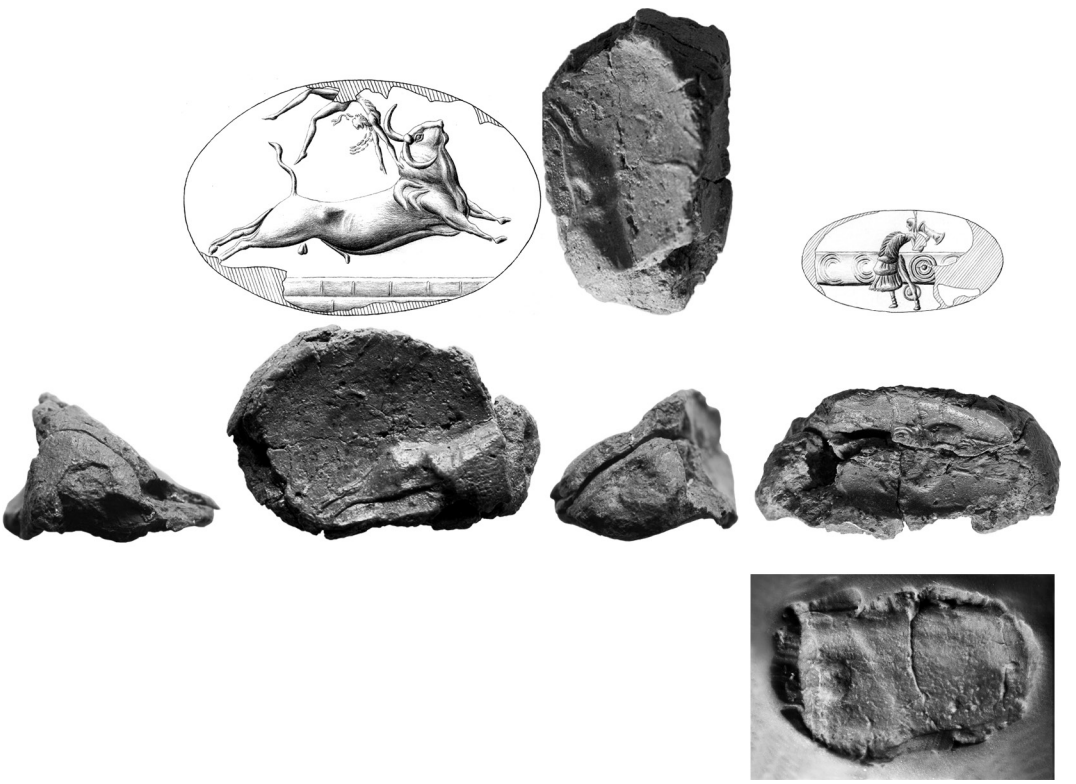
N37/Akrotiri A11687

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.4, W. pres. 0.5, H. 0.65
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 0.8, W. pres. 0.5
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.1, W. pres. 0.45
Leather impression	–
Strings around leather	–
Stylistic dating (seals)	LM I
Preservation	Partially preserved (fragment of the upper part of the nodule); one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 78; *CMS* V Suppl. 3 nos. 392, 393



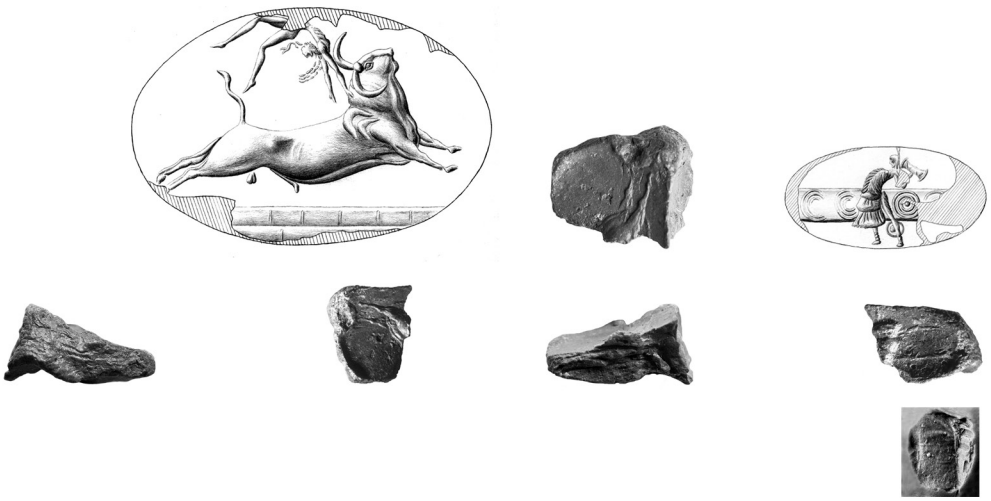
N38/Akrotiri A8926

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.7, W. 1.75, H. 1.3
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.1, W. pres. 1.7
Seal impression b	Signet ring; gold; part of a procession; L. pres. 1.7, W. 1
Leather impression	L. pres. 2.4, W. pres. 1.45
Strings around leather	Perpendicular to the seal impressions; imprints not visible on the surface, but holes exit from inside the clay; –
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 45 + 47; *CMS* V Suppl. 3 nos. 392, 394



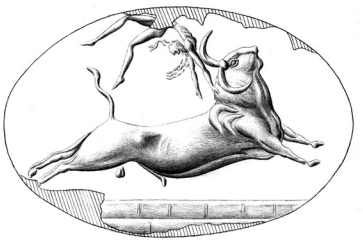
N39/Akrotiri A8927

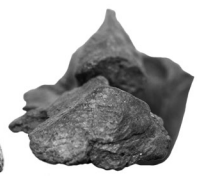
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.05, W. 1.4, H. 0.7
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1, W. pres. 1.2
Seal impression b	Signet ring; gold; part of a procession; L. pres. 0.8, W. pres. 0.65
Leather impression	L. pres. 0.65, W. 1.3
Strings around leather	Perpendicular to the seal impressions; –
Stylistic dating (seals)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 46; *CMS* V Suppl. 3 nos. 392, 394



N40/Akrotiri A8922

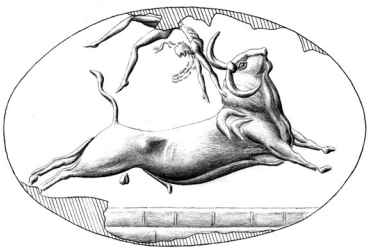
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 3, W. pres. 1.65, H. 1.35
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 2.5, W. pres. 1.2
Seal impression b	–
Leather impression	L. 2.55, W. pres. 1.4
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from three pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 39; *CMS* V Suppl. 3 no. 392

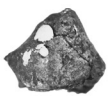




N41/Akrotiri A11682

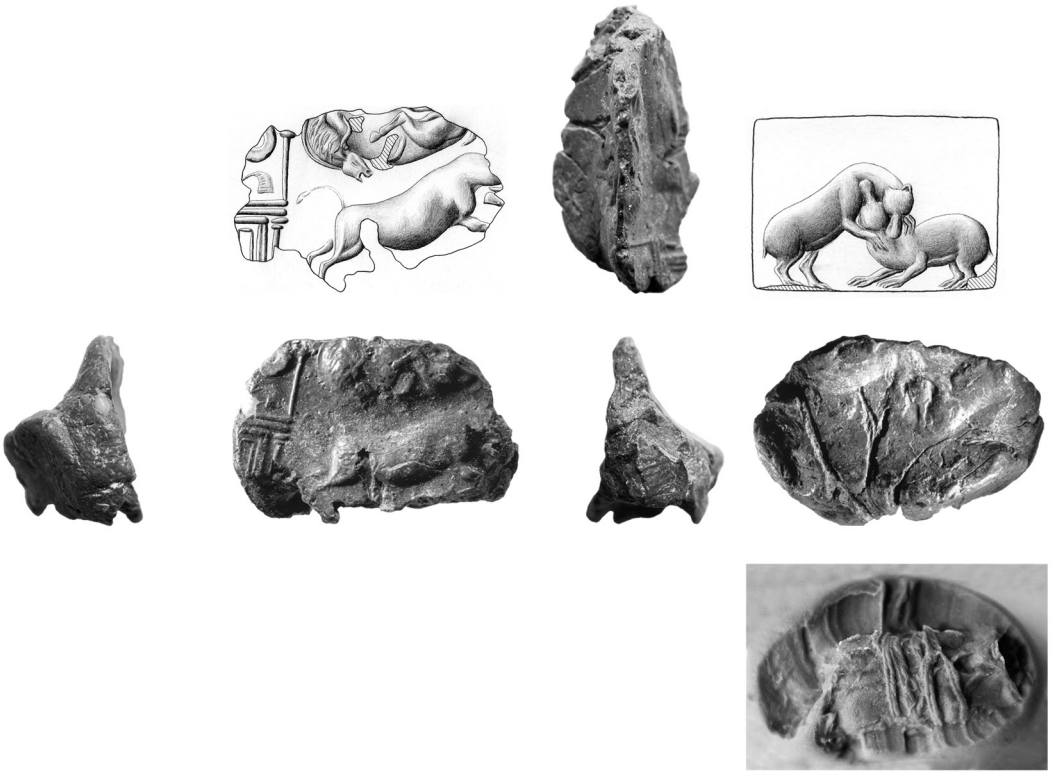
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.5, W. pres. 0.95, H. 0.7
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 1.4, W. pres. 0.75
Seal impression b	–
Leather impression	–
Strings around leather	Perpendicular to the seal impressions; imprints not visible on the surface, but inside the clay
Stylistic dating (seal)	LM I
Preservation	Partially preserved; joined from two pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 72; *CMS* V Suppl. 3 no. 392





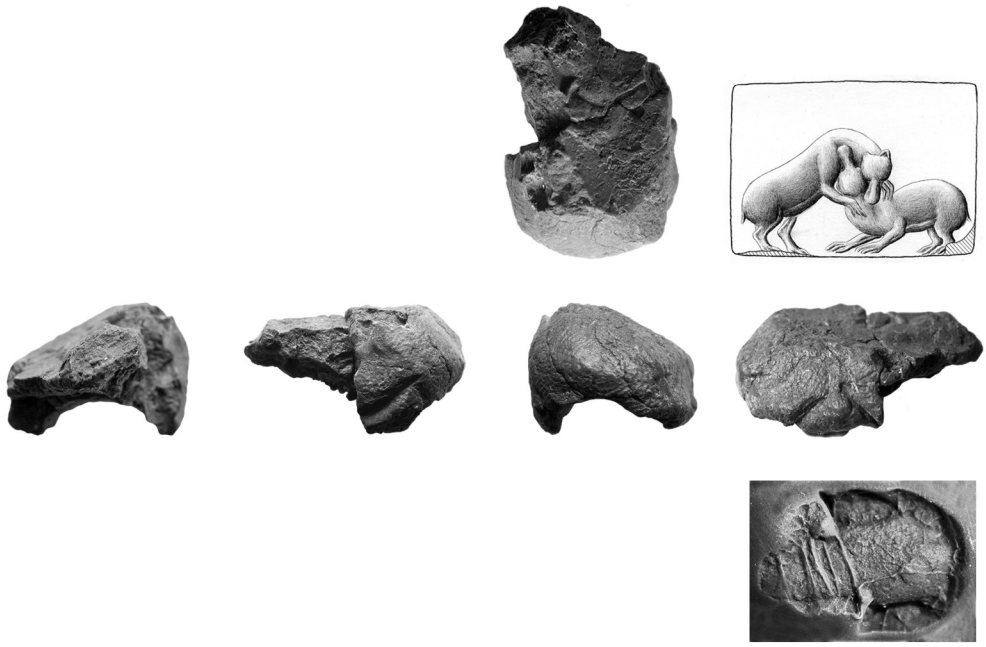
N42/Akrotiri A8945

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 2.55, W. 1.3, H. 1.45
Seal impression a	Signet ring; gold; a building and two bovines; L. pres. 2.3, W. pres. 1.6
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.9, W. pres. 1.4
Leather impression	L. 1.4, W. 0.8
Strings around leather	Perpendicular to the seal impressions; string appears to be double; W. 0.03
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 65; *CMS* V Suppl. 3 nos. 393, 404



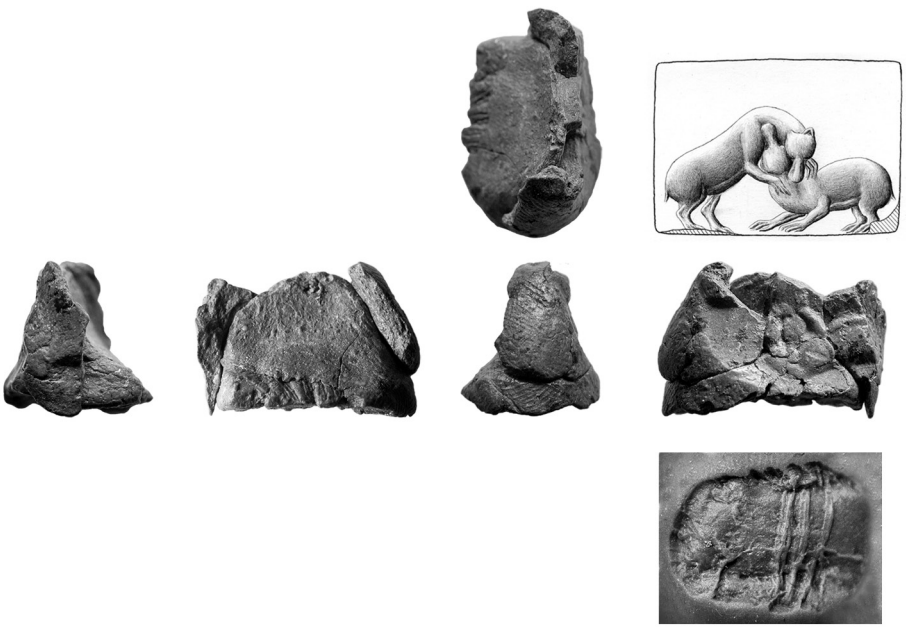
N43/Akrotiri A8918

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 2.25, W. 1.5, H. 0.9–1.05
Seal impression a	Signet ring (?); gold (?); bull-leaping scene (?); L. pres. 0.7, W. pres. 0.95
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1.85, W. pres. 1.2
Leather impression	L. pres. 2, W. 0.9
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Partially preserved; joined from two pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Could be joining with N64
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 35 + 75; *CMS* V Suppl. 3 nos. 392 (?), 393



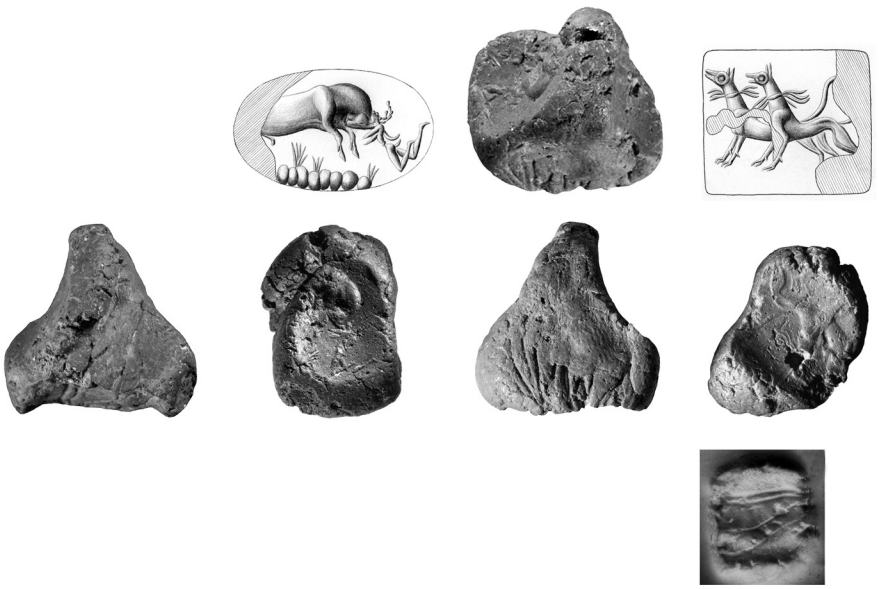
N44/Akrotiri A8917 + A11693

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. 1.95, W. 1.3, H. 1.4
Seal impression a	–: –; internal surface smoothed by finger-tips; –
Seal impression b	Cushion; hard stone; pair of fighting dogs; L. pres. 1, W. pres. 1.1
Leather impression	L. pres. 1.75, W. 1.2
Strings around leather	Perpendicular to the seal impressions; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Partially preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 34 + 85; *CMS* V Suppl. 3 no. 393



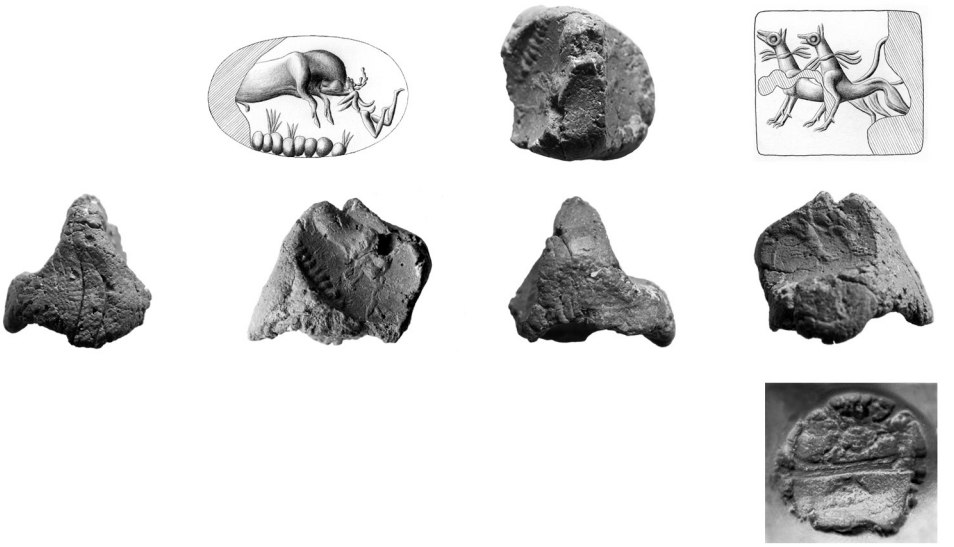
N45/MPTh A8928

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.7, W. 1.3, H. 1.5
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 1.3, W. pres. 0.95
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.1, W. 1.25
Leather impression	L. 1, W. 1
Strings around leather	Parallel to the seal impressions; W. 0.025
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 48; *CMS* V Suppl. 3 nos. 395, 396



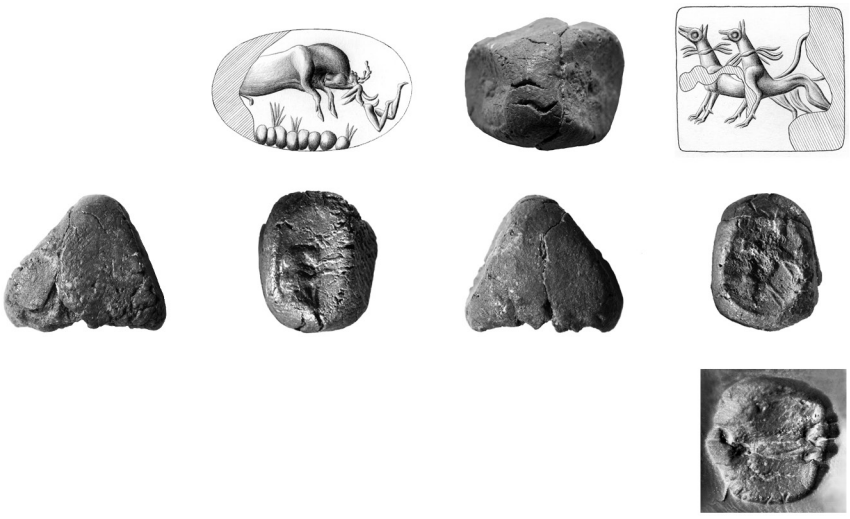
N46/Akrotiri A8929

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.55, W. 1.6, H. 1.35
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 1.5, W. pres. 1
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.3, W. pres. 0.9
Leather impression	L. 1.35, W. 1.4
Strings around leather	Parallel to the seal impressions; W. 0.02
Stylistic dating (seals)	LM I
Preservation	Almost perfectly preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 49; *CMS* V Suppl. 3 nos. 395, 396



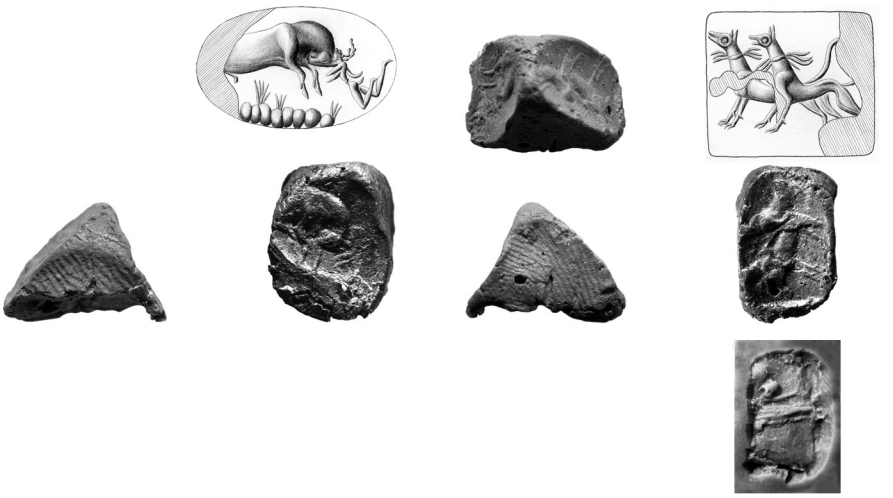
N47/Akrotiri A8930

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.25, W. 1.55, H. 1.2
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 1.1, W. pres. 0.7
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.2, W. pres. 0.9
Leather impression	L. 1, W. 1.25
Strings around leather	Parallel to the seal impressions; W. 0.02
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; joined from two pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 50; *CMS* V Suppl. 3 nos. 395, 396



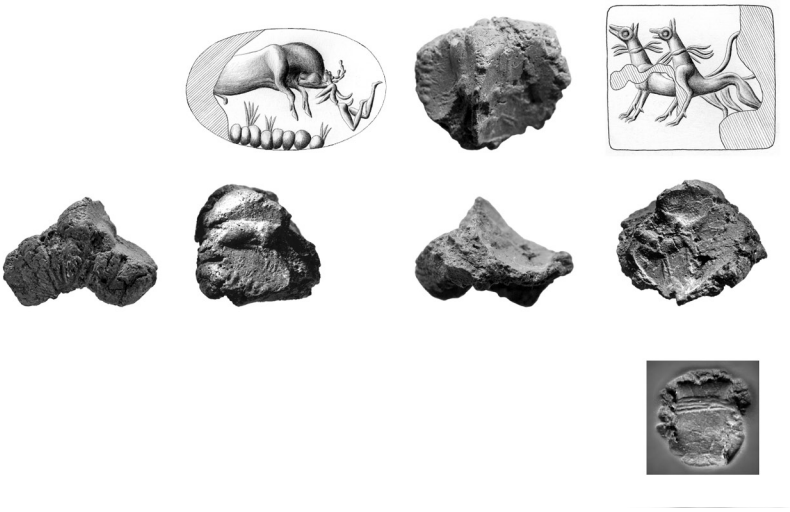
N48/Akrotiri A8931

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 0.8, W. 1.4, H. 0.85
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 0.95, W. pres. 0.8
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.1, W. pres. 0.75
Leather impression	L. 0.8, W. 1.2
Strings around leather	Parallel to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 51; *CMS* V Suppl. 3 nos. 395, 396



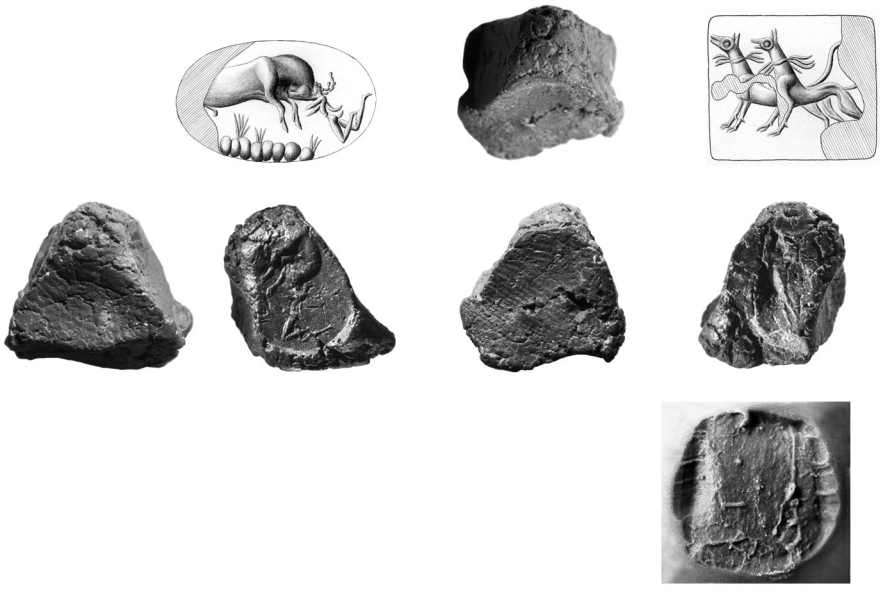
N49/Akrotiri A8932

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.7, W. 1.9, H. 1
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 1, W. pres. 1.15
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.3, W. pres. 1.1
Leather impression	L. 1, W. pres. 1.4
Strings around leather	Parallel to the seal impressions; W. 0.05
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 52; *CMS* V Suppl. 3 nos. 395, 396



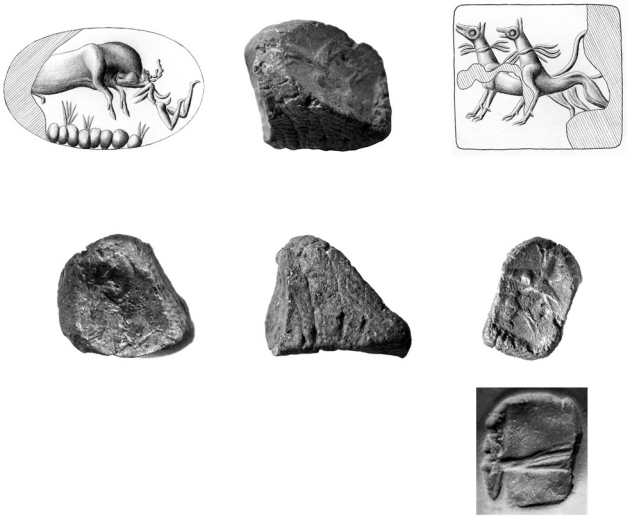
N50/Akrotiri A8933

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.05, W. 1.5, H. 1.35
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 0.95, W. pres. 0.8
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.2, W. pres. 0.8
Leather impression	L. pres. 1.15, W. pres. 1.2
Strings around leather	Parallel to the seal impressions, visible only internally; –
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 53; *CMS* V Suppl. 3 nos. 395, 396



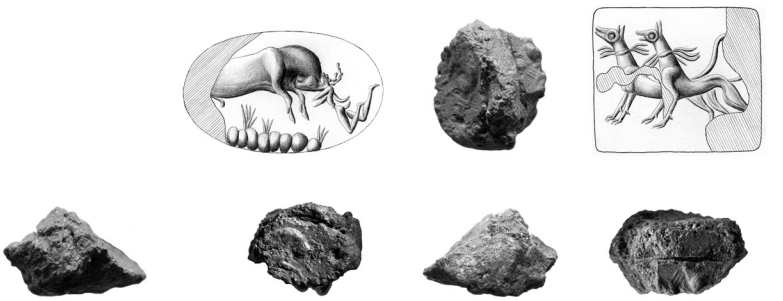
N51/Akrotiri A8934

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.95, W. 1.25, H. 1.1
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 1, W. pres. 0.8
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.2, W. pres. 0.85
Leather impression	L. pres. 0.9, W. pres. 1.2
Strings around leather	Parallel to the seal impressions; W. 0.03
Stylistic dating (seals)	LM I
Preservation	Perfectly preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 54; *CMS* V Suppl. 3 nos. 395, 396



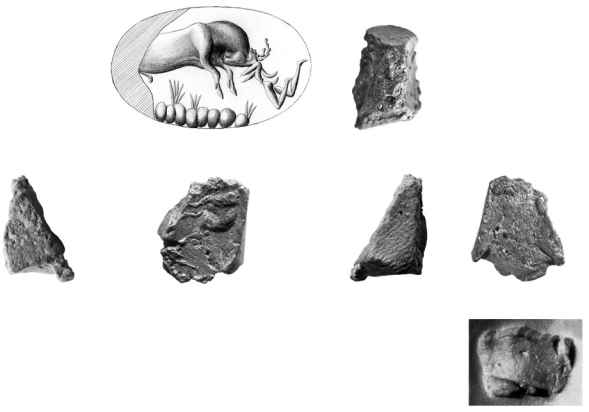
N52/Akrotiri A8935

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.25, W. pres. 1.05, H. 0.7
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 1, W. pres. 0.65
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 0.6, W. pres. 0.3
Leather impression	–
Strings around leather	Parallel to the seal impressions, visible only internally; –
Stylistic dating (seals)	LM I
Preservation	Very small part preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Could be joining with N65
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 55; *CMS* V Suppl. 3 nos. 395, 396



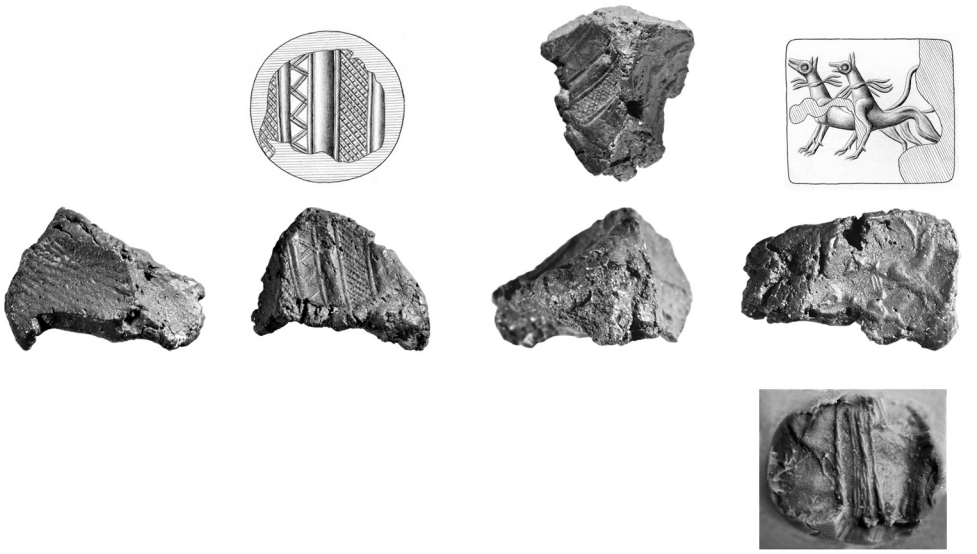
N53/Akrotiri A8936

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 0.95, W. pres. 0.65, H. 0.95
Seal impression a	Signet ring; gold; bull-leaping/grappling scene; L. pres. 1.2, W. pres. 0.75
Seal impression b	–
Leather impression	L. 0.9, W. pres. 0.5
Strings around leather	Parallel to the seal impressions, visible only internally
Stylistic dating (seal)	LM I
Preservation	Very small part preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 56; *CMS* V Suppl. 3 no. 395



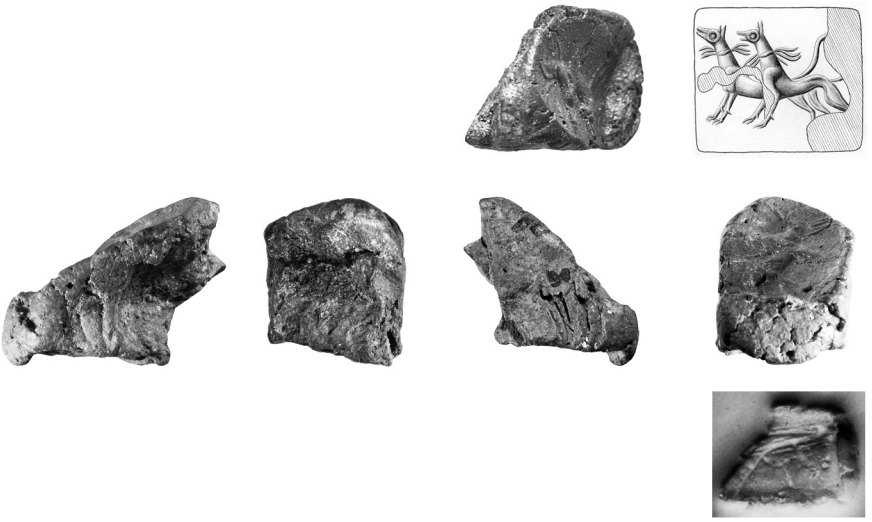
N54/Akrotiri A8939

Object type	Flat-based nodule, two-seal (shape: triangular 'pyramid')
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.95, W. 1.7, H. 1.1
Seal impression a	Round convex seal face; hard stone; 'tectonic' motif; L. pres. 1.3, W. pres. 1.2
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.15, W. pres. 1.4
Leather impression	L. pres. 1.5, W. pres. 1.1
Strings around leather	Perpendicular to the seal impressions; W. 0.05–0.1
Stylistic dating (seals)	MM II–III
Preservation	Perfectly preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 59; *CMS* V Suppl. 3 nos. 396, 397



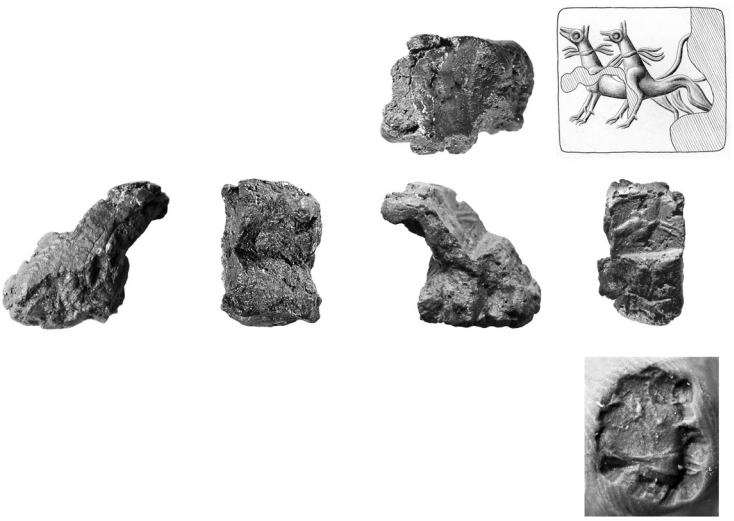
N55/MPTh A8937

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.1, W. pres. 1.5, H. 1.35
Seal impression a	–
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.35, W. pres. 1
Leather impression	L. pres. 1.1, W. 0.9
Strings around leather	Parallel to the seal impressions; W. 0.025
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 57; *CMS* V Suppl. 3 no. 396



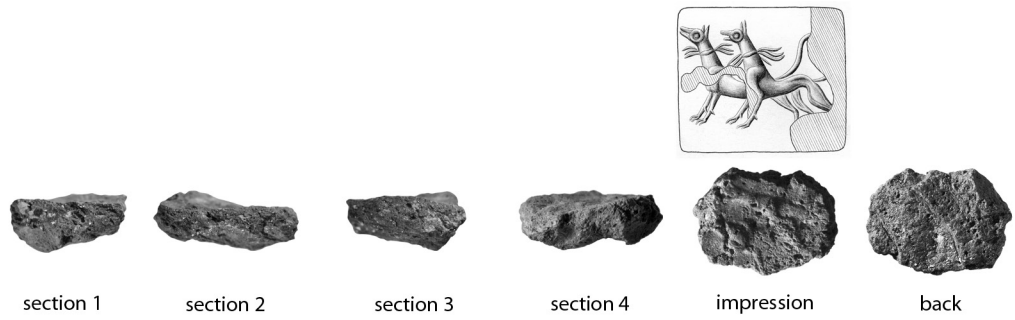
N56/Akrotiri A8938

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 0.85, W. pres. 1.3, H. 1.3
Seal impression a	–
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 0.7, W. pres. 0.75
Leather impression	L. 0.8, W. pres. 0.8
Strings around leather	Parallel to the seal impressions; W. 0.03
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Could be joining with N65
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 58; *CMS* V Suppl. 3 no. 396



N57/Akrotiri A11796

Object type	Flat-based (?) nodule, two-seal (?)
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.25, W. pres. 0.9, H. 0.4
Seal impression a	–
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 1.2, W. pres. 0.95
Leather impression	–
Strings around leather	–
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; *CMS* V Suppl. 3 no. 396



N58/Akrotiri A8940

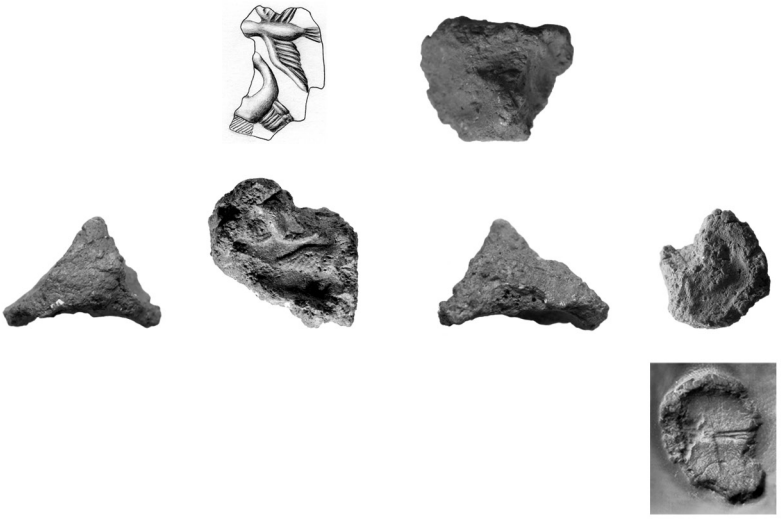
Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.25, W. pres. 1.35, H. 0.8
Seal impression a	Amygdaloid (?); hard stone; couchant bull; L. pres. 1.1, W. pres. 0.7
Seal impression b	Signet ring (?); metal; man; L. pres. 1.1, W. pres. 0.7
Leather impression	L. 1.2, W. 1.3
Strings around leather	Parallel to the seal impressions; W. 0.1
Stylistic dating (seals)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment nos. 60 + 84; *CMS* V Suppl. 3 nos. 398, 399

N59/Akrotiri A8944

Object type	Flat-based nodule, two-seal (?)
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.4, W. pres. 1.35, H. 0.75
Seal impression a	Lentoid; hard stone; heraldic griffins/sphinxes; L. pres. 1.1, W. pres. 0.95
Seal impression b	–
Leather impression	L. 1.3, W. pres. 1.3
Strings around leather	Parallel to the seal impressions; W. 0.07
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 64; *CMS* V Suppl. 3 no. 403

N60/Akrotiri A8946

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 1.3, W. pres. 1.7, H. 0.95
Seal impression a	Lentoid (?); hard stone or metal (?); flying bird(s); L. pres. 1.2, W. pres. 1.15
Seal impression b	–
Leather impression	L. pres. 1, W. pres. 1.4
Strings around leather	Parallel to the seal impressions; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 66; *CMS* V Suppl. 3 no. 405

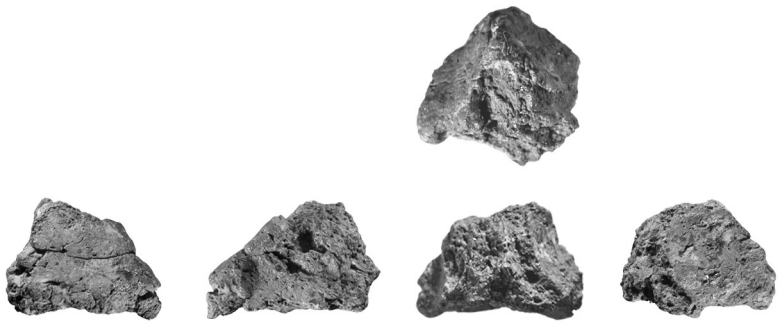


N61/Akrotiri A11697

Object type	Flat-based nodule, two-seal (?)
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.75, W. pres. 0.95, H. 0.95
Seal impression a	–; –; –; L. pres. 1.3, W. pres. 0.8
Seal impression b	–
Leather impression	L. pres. 1.55, W. pres. 0.8
Strings around leather	Parallel to the seal impressions; W. 0.05
Stylistic dating (seals)	–
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 90

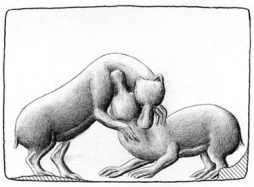
N62/Akrotiri A11700

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.5, W. 1.45, H. 1
Seal impression a	–; –; –; L. pres. 0.85, W. pres. 0.75
Seal impression b	–; –; Two little feet (?); L. pres. 0.75, W. pres. 0.6
Leather impression	L. pres. 1.25, W. pres. 1.25
Strings around leather	Parallel to the seal impressions, visible only internally; W. 0.05
Stylistic dating (seals)	–
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 93



N63/Akrotiri A11684

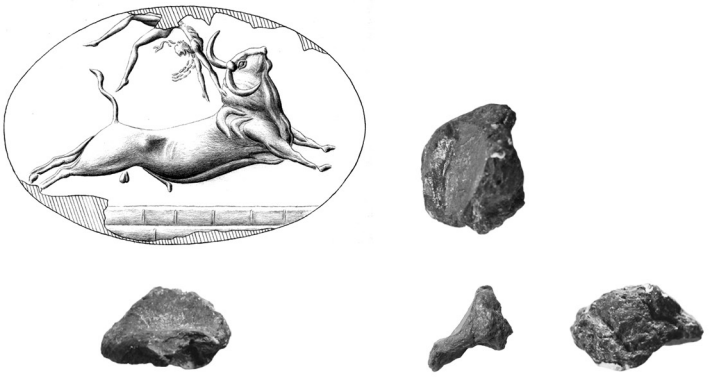
Object type	Flat-based nodule
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.1, W. pres. 1.15, H. 0.5
Seal impression	Cushion; hard stone; pair of fighting dogs; L. pres. 1, W. pres. 1.25
Leather impression	–
Strings around leather	–
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta, Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 74; *CMS* V Suppl. 3 no. 393



section 1 section 2 section 3 section 4 impression back

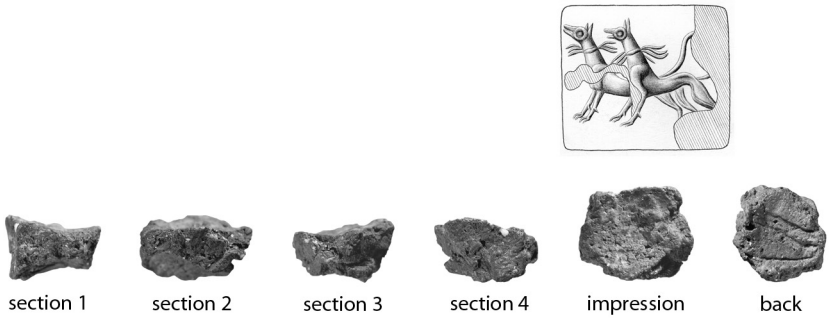
N64/Akrotiri A11685

Object type	Flat-based nodule, two-seal (?)
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.1, W. pres. 1.2, H. 0.6
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 0.85, W. pres. 1
Seal impression b	–
Leather impression	L. pres. 1, W. pres. 0.75
Strings around leather	Perpendicular to the seal impressions; W. 0.03
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Could be joining with N43
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 76; *CMS* V Suppl. 3 no. 392



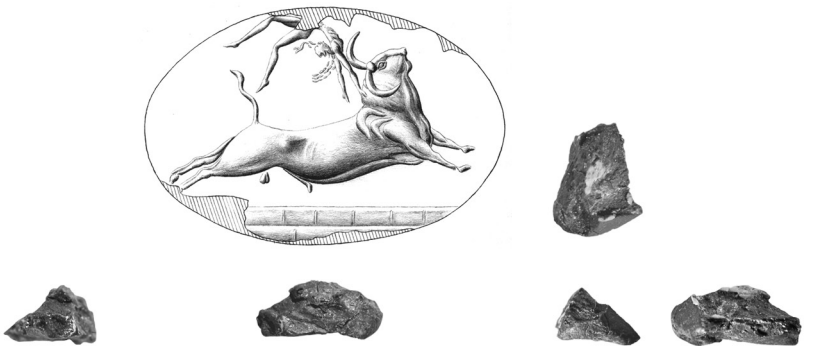
N65/Akrotiri A11686

Object type	Flat-based nodule, two-seal (?)
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. 0.85, W. pres. 1, H. 0.6
Seal impression a	–
Seal impression b	Cushion; hard stone; pair of standing dogs; L. pres. 0.5, W. pres. 0.65
Leather impression	–
Strings around leather	Parallel to the seal impressions; W. 0.05
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Could be joining with either N52 or N56 on account of its size
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 77; *CMS* V Suppl. 3 no. 396



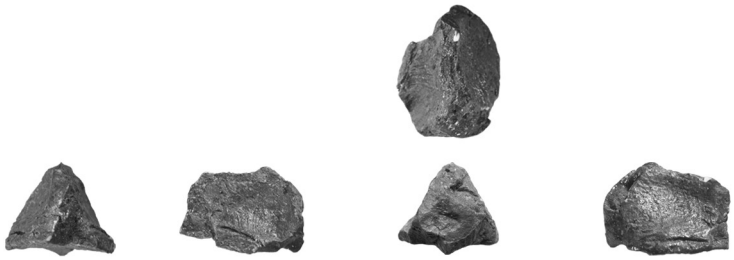
N66/Akrotiri A11692

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.15, W. pres. 1.08, H. 0.5
Seal impression a	Signet ring; gold; bull-leaping scene; L. pres. 0.9, W. pres. 0.55
Seal impression b	–; –; –; L. pres. 0.6, W. pres. 0.35
Leather impression	–
Strings around leather	–
Stylistic dating (seal)	LM I
Preservation	Partially preserved; joined from two pieces
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 83; *CMS* V Suppl. 3 no. 392



N67/Akrotiri A11698

Object type	Flat-based nodule, two-seal
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.15, W. pres. 0.9, H. 0.7
Seal impression a	–; –; –; L. pres. 0.05, W. pres. 0.05
Seal impression b	–
Leather impression	–
Strings around leather	Perpendicular to the seal impressions; visible only internally; –
Stylistic dating (seal)	–
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Possibly joining with N12
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 91

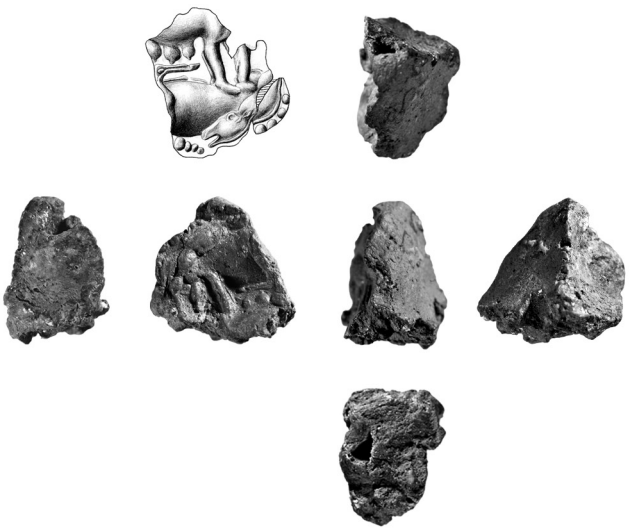


N68/Akrotiri A11699

Object type	Flat-based nodule, two-seal (?)
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	C
Dimensions	L. pres. 1.15, W. pres. 1.1, H. 0.7
Seal impression a	–; –; –; L. pres. 0.85, W. pres. 0.8
Seal impression b	–
Leather impression	–
Strings around leather	–
Stylistic dating (seal)	–
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 92

N69/Akrotiri A8942

Object type	One-hole hanging nodule, one-seal
Material	Clay, unfired; finely gritted; reddish-yellow
Clay paste	D
Dimensions	L. 1.3, W. 0.9, H. 1.35
Seal impression	–; hard stone; lioness attacking a bovine; L. pres. 1.2, W. pres. 0.55
String	W. 1.2
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 62; *CMS* V Suppl. 3 no. 401

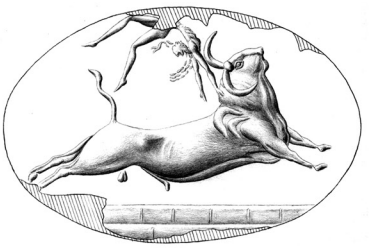


N70/Akrotiri A11695

Object type	Two-hole hanging nodule
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	E
Dimensions	L. 2.65, W. pres. 1.25, H. 1.55
Seal impression	–
String	–
Stylistic dating (seal)	–
Preservation	Partially (half [?]) preserved; joined from three pieces; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 88

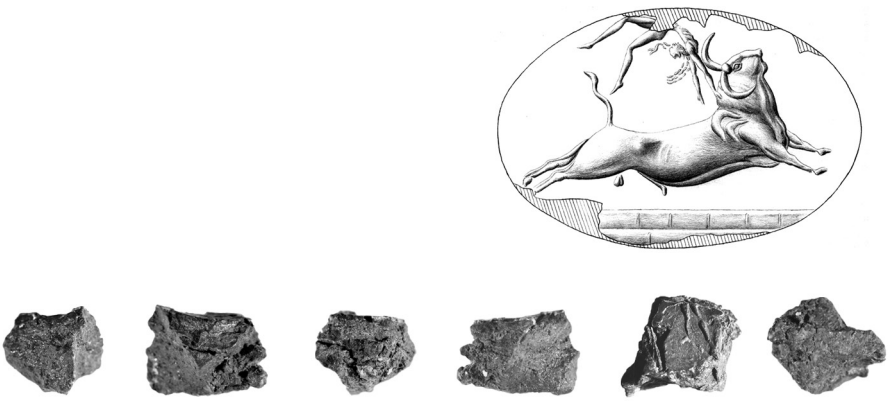
N71/Akrotiri A8921

Object type	Nodule
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	Uncertain
Dimensions	L. pres. 1.25, W. pres. 1.75, H. 0.75
Seal impression	Signet ring; gold; bull-leaping scene; L. pres. 0.95, W. pres. 1.5
Stylistic dating (seal)	LM I
Preservation	Very small part preserved; one piece; black speckles on surface (organic residues)
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 38; *CMS* V Suppl. 3 no. 392



N72/Akrotiri A8925

Object type	Nodule
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 1.1, W. pres. 0.95, H. 0.75
Seal impression	Signet ring; gold (?); bull-leaping scene; L. pres. 0.7, W. pres. 0.8
Stylistic dating (seal)	LM I
Preservation	Very small part preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 43; *CMS* V Suppl. 3 no. 392



N73/Akrotiri A11689

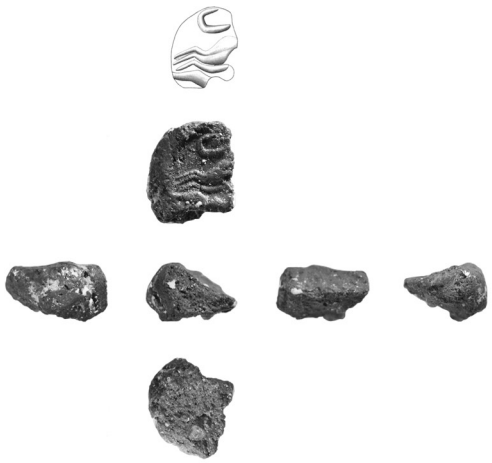
Object type	Nodule
Material	Clay, unfired; finely gritted; reddish-brown
Clay paste	A
Dimensions	L. pres. 0.85, W. pres. 0.95, H. 0.75
Seal impression	–; –; –; L. pres. 0.8, W. pres. 0.65
Stylistic dating (seal)	–
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18b-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	4–7/7/1995
Observations	Could be joining with N29
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 80

N74/Akrotiri A8943

Object type	Direct nodule, one-seal
Material	Clay, unfired; finely gritted; brown-red
Clay paste	F
Dimensions	L. pres. 1.4, W. 1.7, H. 0.5
Seal impression	Lentoid (?); hard stone (?); lion and griffin; L. pres. 1.3, W. pres. 1.25
Object (peg) impression	Ø 1.25, H. 0.55
String(s)	Th. 0.05–0.1
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	Complex Delta (Δ), Delta-East, Room D18a-ground level
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	25/8/1993
Bibliography	*Praktika* 1995, 127–30, pl. 63; Doumas 2000b, 64, table 1, fragment no. 63; *CMS* V Suppl. 3 no. 402

N75/Akrotiri A11701

Object type	*Nodulus*
Material	Clay, unfired; finely gritted, but with one large inclusion; red-brown
Clay paste	G
Dimensions	L. pres. 0.74, W. pres. 0.8, H. 0.48
Seal impression	Signet ring (?); metal (?); running lion/griffin/dog, second running animal underneath; L. pres. 0.58, W. pres. 0.73
Stylistic dating (seal)	LM I
Preservation	Partially preserved; one piece
Findspot	NPP 64
Context dating	LC I (VDL)
Provenance	Imported
Retrieval date	16/12/1999
Bibliography	*Praktika* 1999, pl. 122c–d; Michailidou 2006, 245; Karnava 2008, 380–81

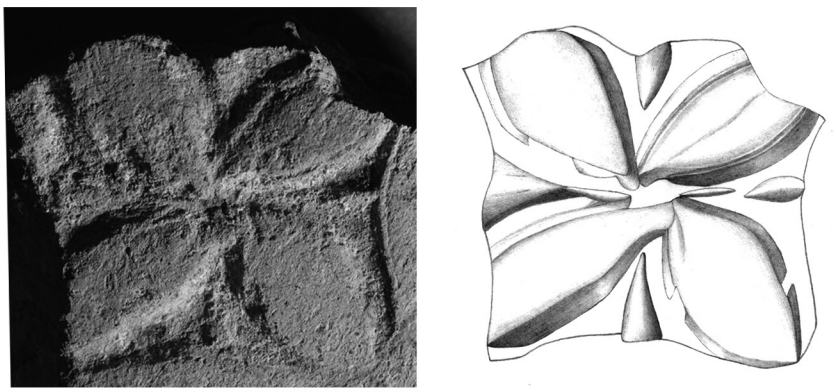


OBJECTS WITH SEAL IMPRESSIONS

I1/Akrotiri A4385

Object type	Discoid loomweight
Material	Clay; yellowish brown, grey core; sizeable inclusions, no mica
Dimensions	L. pres. 6.7, H. pres. 5.5, Th. max. 2.9
Number of seal impressions	One
Seal impression	Flat quadrangular seal face; soft stone or bone; quatrefoil; L. 2.7, W. pres. 2.53
Stylistic dating (seal)	–
Preservation	Fragment, almost half of the original; in good state, except for chipped edges
Findspot	Delta 4, upper level (?)
Context dating	LC I (VDL)
Provenance	Not clear if local or imported
Retrieval date	03/09/1970
Bibliography	–

1:2



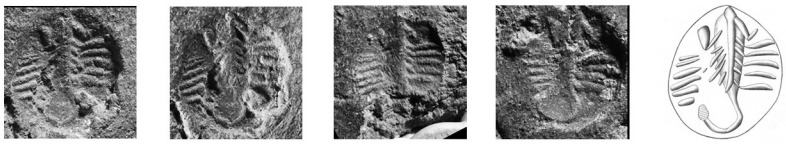
3:2

I2/Akrotiri A8534

Object type	Pithos rim
Material	Clay; yellowish brown; black paint (rim), trickle pattern (body)
Dimensions	W. 35.6, H. 13.5; wall Th. 1.7; rim Th. 4.5
Number of seal impressions	At least 13
Seal impression	Asymmetrical oval convex seal face; hard stone (?); scorpion; L. 1.1, W. 1
Stylistic dating (seal)	–
Preservation	Fragment of the rim and body of a pithos; joined from four sherds
Findspot	NPP 64A (S of Xeste 2/SE of another building), open-air debris
Context dating	LC I (SDL or VDL)
Provenance	Local
Retrieval date	27/02/2000
Bibliography	Karnava – Nikolakopoulou 2005

1:8

no scale



3:2

I3/Akrotiri A10990

Object type	Spherical loomweight ('melon')
Material	Clay; brownish yellow, grey-black core; gritty with sizeable inclusions; biological residues or traces of burning on the surface
Dimensions	L. pres. 6.65, H. pres. 5.65, Th. pres. 4.7
Number of impressions	One
Seal impression	Round flat seal face; soft material (stone/bone/ivory); whirl; Ø 1.85
Stylistic dating (seal)	–
Preservation	Fragment, unknown original dimensions
Findspot	NPP 62 (NE of Xeste 4); open-air debris
Context dating	LC I (SDL or VDL)
Provenance	Not clear if local or imported
Retrieval date	15/12/1999
Bibliography	–

1:2

3:2

BIBLIOGRAPHY

ABBREVIATIONS OF LITERATURE

Journals and Series

AA	*Archäologischer Anzeiger*
AEA	*Aegean Archaeology*
Aegaeum	Annales d'archéologie égéenne de l' Université de Liège
Aegis	Aegean Interdisciplinary Studies
ÄgLev	*Ägypten und Levante. Egypt and the Levant. Internationale Zeitschrift für ägyptische Archäologie und deren Nachbargebiete*
AJA	*American Journal of Archaeology*
ALS	*Periodical Edition of the Society for the Promotion of Studies on Prehistoric Thera*
AM	*Mitteilungen des Deutschen Archäologischen Instituts, Athenische Abteilung*
Anatolica	*Anatolica: Annuaire international pour les civilisations de l'Asie antérieure*
AnatSt	*Anatolian Studies*
Antiquity	*Antiquity: A Quarterly Review of Archaeology*
AntJ	*The Antiquaries Journal*
ArchEph	*Αρχαιολογική εφημερίς*
ASAtene	*Annuario della Scuola Archeologica di Atene e delle missioni italiane in Oriente*
AV	Archäologische Veröffentlichungen. Deutsches Archäologisches Institut, Abteilung Kairo
BAR-IS	British Archaeological Reports, International Series
BASOR	*Bulletin of the American Schools of Oriental Research*
BCH	*Bulletin de correspondance hellénique*
Belleten	*Belleten: Türk Tarih Kurumu*
BICS	*Bulletin of the Institute of Classical Studies of the University of London*
BMCR	*Bryn Mawr Classical Review*
BSA	*Annual of the British School at Athens*
CAJ	*Cambridge Archaeological Journal*
CRAI	*Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres*
CretAnt	*Creta Antica: Rivista internazionale di studi archeologici, storici ed epigrafici*
CretChron	*Κρητικά χρονικά: Κείμενα και μελέται κρητικής ιστορίας*
CRIPEL	*Cahier de recherches de l'Institut de Papyrologie et d'Égyptologie de Lille. Sociétés urbaines en Égypte et au Soudan*
EPJ Plus	*The European Physical Journal Plus*
Ergon	*Το έργον της εν Αθήναις Αρχαιολογικής Εταιρείας*
ÉtCrét	Études crétoises
Hesperia	*Hesperia: The Journal of the American School of Classical Studies at Athens*

HSAO	Heidelberger Studien zum Alten Orient
Hydra	*Hydra. Working Papers in Middle Bronze Age Studies*
IrAnt	*Iranica antiqua*
JAS	*Journal of Archaeological Science*
JEA	*The Journal of Egyptian Archaeology*
JFA	*Journal of Field Archaeology*
JHS	*Journal of Hellenic Studies*
JMA	*Journal of Mediterranean Archaeology*
JNES	*Journal of Near Eastern Studies*
Kadmos	*Kadmos: Zeitschrift für vor- und frühgriechische Epigraphik*
KTEMA	*KTEMA: Civilisations de l'Orient, de la Grèce et de Rome antiques*
Kush	*Journal of the Sudan Antiquities Service*
Minos	*Minos: Revista de filología egea*
NEA	*Near Eastern Archaeology* (formerly *BiblArch)*
OA	*Oriens antiquus*
OJA	*Oxford Journal of Archaeology*
OREA	Oriental and European Archaeology
PCPS	*Proceedings of the Cambridge Philological Society*
Praktika	*Πρακτικά της εν Αθήναις Αρχαιολογικής Εταιρείας*
PZ	*Prähistorische Zeitschrift*
Radiocarbon	*Radiocarbon. An International Journal of Cosmogenic Isotope Research*
RÉg	*Revue d'égyptologie*
SANER	Studies in Ancient Near Eastern Records
SIMA	Studies in Mediterranean Archaeology
SIMA-PB	Studies in Mediterranean Archaeology and Literature: Pocketbook
SMEA	*Studi micenei ed egeo-anatolici*
StOrE	*Studia Orientalia Electronica*
WorldArch	*World Archaeology*

Corpora and Lexica

EncAE	K. A. Bard (ed.). 1999. *Encyclopedia of the Archaeology of Ancient Egypt*. London – New York (Routledge).
CHIC	J.-P. Olivier – L. Godart. 1996. *Corpus hieroglyphicarum inscriptionum Cretae.* ÉtCrét 31. Paris (École française d'Athènes).
CMS I–XIII	F. Matz/H. Biesantz/I. Pini/W. Müller (eds.). 1964–2009. *Corpus der minoischen und mykenischen Siegel* I–XIII. Berlin/Mainz (Gebrüder Mann/Philipp von Zabern).
GORILA I–V	L. Godart – J.-P. Olivier. 1976–85. *Recueil des inscriptions en linéaire A,* I–V. ÉtCrét 21. Paris (École française d'Athènes).
RLA 1–15	E. Ebeling – B. Meissner/E. Weidner – W. von Soden – D. O. Edzard/M. P. Streck (eds.). 1932–2017. *Reallexikon der Assyriologie und vorderasiastischen Archäologie*. Berlin – Leipzig/Berlin – New York/ Berlin – Boston (De Gruyter).

Short Titles

PRINTED VOLUMES

Ergon 1969 — A. K. Orlandos (ed.). 1969 *(1970). Το έργον της Αρχαιολογικής Εταιρείας κατά το 1969*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 150–64.

Ergon 1970 — A. K. Orlandos (ed.). 1970 (1971). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1970*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 145–61.

Ergon 1971 — A. K. Orlandos (ed.). 1971 (1972). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1971*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 186–206.

Ergon 1975 — A. K. Orlandos (ed.). 1975 (1976). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1975*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 145–48.

Ergon 1985 — G. E. Mylonas (ed.). 1985 (1986). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1985*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 62–65.

Ergon 1990 — V. C. Petrakos (ed.). 1990 (1991). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1990*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 108–13.

Ergon 1992 — V. C. Petrakos (ed.). 1992 (1993). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1992*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 75–81.

Ergon 1995 — V. C. Petrakos. 1995 (1996). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1995*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 52–57.

Ergon 1999 — V. C. Petrakos. 1999 (2000). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 1999*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 77–80.

Ergon 2000 — V. C. Petrakos. 2000 (2001). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 2000*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 88–95.

Ergon 2001 — V. C. Petrakos. 2001 (2002). *Το έργον της Αρχαιολογικής Εταιρείας κατά το 2001*. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 72–79.

Praktika 1975 — C. G. Doumas. 1975 (1977). Ανασκαφή Θήρας. *Praktika* 1975 A: 212–29.

Praktika 1976 — C. G. Doumas. 1976 (1979). Ανασκαφή Θήρας. *Praktika* 1976 B: 309–29.

Praktika 1977 — C. G. Doumas. 1977 (1980). Ανασκαφή Θήρας. *Praktika* 1977 B: 387–99.

Praktika 1984 — C. G. Doumas. 1984 (1991). Ανασκαφή Θήρας (Ακρωτήρι). *Praktika* 1984 B: 340–48.

Praktika 1985 — C. G. Doumas. 1985 (1990). Ανασκαφή Θήρας (Ακρωτήρι). *Praktika* 1985: 168–76.

Praktika 1987 — C. G. Doumas. 1987 (1991). Ανασκαφή Θήρας (Ακρωτηρίου). *Praktika* 1987: 241–54.

Praktika 1990 — C. G. Doumas. 1990 (1993). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 1990: 224–35.

Praktika 1992 — C. G. Doumas. 1992 (1995). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 1992: 176–88.

Praktika 1993 — C. G. Doumas. 1993 (1996). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 1993: 164–87.

Praktika 1994 — C. G. Doumas. 1994 (1997). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 1994: 55–66.

Praktika 1995 — C. G. Doumas. 1995 (1998). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 1995: 127–36.

Praktika 1996 C. G. Doumas. 1996 (1998). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 1996: 247–57.

Praktika 1999 C. G. Doumas. 1999 (2002). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 1999: 155–202.

Praktika 2000 C. G. Doumas. 2000 (2003). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 2000: 169–72.

Praktika 2001 C. G. Doumas. 2001 (2004). Ανασκαφή Ακρωτηρίου Θήρας. *Praktika* 2001: 129–30.

Thera I S. Marinatos. 1999. *Excavations at Thera* I. *1967 Season*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 64. 2nd ed. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία).

Thera II S. Marinatos. 1999. *Excavations at Thera* II. *1968 Season*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 64. 2nd ed. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία).

Thera III S. Marinatos. 1999. *Excavations at Thera* III. *1969 Season*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 64. 2nd ed. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία).

Thera IV S. Marinatos. 1999. *Excavations at Thera* IV. *1970 Season*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 64. 2nd ed. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία).

Thera V S. Marinatos. 1999. *Excavations at Thera* V. *1971 Season*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 64. 2nd ed. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία).

Thera VI S. Marinatos. 1999. *Excavations at Thera* VI. *1972 Season*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 64. 2nd ed. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία).

Thera VII S. Marinatos. 1999. *Excavations at Thera* VII. *1973 Season*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 64. 2nd ed. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία).

ONLINE RESOURCES

Arachne *Central Object-Database of the German Archaeological Institute and the University of Cologne*: http://arachne.uni-koeln.de/drupal/ (accessed on 9/10/2017).

Arshama Letters *Thus Speaks Arshama, Letters of a Fifth-Century BC Persian Prince:* https://arshama.bodleian.ox.ac.uk/ (accessed on 9/10/2017).

Calames *Online Catalogue of Archives and Manuscripts in French University and Research Libraries*: http://www.calames.abes.fr/pub/ (accessed on 9/10/2017).

CMS Seal Database R. Förtsch – H. von Hesberg – W. Müller – I. Pini, *Corpus der minoischen und mykenischen Siegel*. In *Arachne*: http://arachne.uni-koeln.de/drupal/?q=de_DE/node/117 (accessed on 3/10/2017).

Khalili Collections *The Khalili Collections*: http://www.khalilicollections.org/ (accessed on 9/10/2017).

REFERENCES

Printed and Online Volumes

Abell 2016 — N. Abell. 2016. Minoanisation in the Middle Bronze Age: evaluating the role of Cycladic producers and consumers. *BSA* 111: 71–93.

Alexiou – Warren 2004 — S. Alexiou – P. Warren. 2004. *The Early Minoan Tombs of Lebena, Southern Crete*. SIMA 30. Sävedalen (Paul Åströms Förlag).

Allen 2005 — M. Allen. 2005. Power is in the details: administrative technology and the growth of ancient Near Eastern cores. In C. Chase-Dunn – E. N. Anderson (eds.), *The Historical Evolution of World-Systems*. Basingstoke (Palgrave Macmillan): 75–91.

Amandry 1975 — P. Amandry. 1975. Informations sur les fouilles d'Akrotiri (île de Santorin). *CRAI* 119.3: 334–35.

Anastasiadou 2010 — M. Anastasiadou. 2010. Gruppen innerhalb der mittelminoischen dreiseitigen Prismen aus weichem Stein. In W. Müller (ed.), *Die Bedeutung der minoischen und mykenischen Glyptik. VI. Internationales Siegel-Symposium aus Anlass des 50 jährigen Bestehens des CMS, Marburg, 9.–12. October 2008*. *CMS* Beiheft 8. Mainz am Rhein (Philipp von Zabern): 57–72.

Anastasiadou 2011 — M. Anastasiadou. 2011. *The Middle Minoan Three-Sided Soft Stone Prism. A Study of Style and Iconography*. *CMS* Beiheft 9. Darmstadt/Mainz (Philipp von Zabern).

Anastasiadou 2015 — M. Anastasiadou. 2015. The seals. In A. Karetsou – L. Girella (eds.), *Kalochorafitis. Two Chamber-Tombs from the LM IIIA2-B Cemetery. A Contribution to Postpalatial Funerary Practice in the Mesara*. Padova (Bottega d'Erasmo): 257–76.

Anastasiadou 2016 — M. Anastasiadou. 2016. Drawing the line: seals, script and regionalism in Protopalatial Crete. *AJA* 120.2: 159–93.

Anderson 2013 — E. S. K. Anderson. 2013. Reembodying identity: seals and seal impressions as agents of social change on late Prepalatial Crete. In J. Englehardt (ed.), *Agency in Ancient Writing*. Boulder (University Press of Colorado): 115–38.

Anderson 2016 — E. S. K. Anderson. 2016. *Seals, Craft and Community in Bronze Age Crete*. Cambridge – New York (Cambridge University Press).

Argyrou-Brand 2009 — M. Argyrou-Brand. 2009. *Die Siedlung von Akrotiri auf Thera. Politisch-soziale Aspekte*. Taunusstein (Verlag Dr. H. H. Driesen GmbH).

Argyrou-Brand 2012 — M. Argyrou-Brand. 2012. Die Bedeutung der privaten Administration in Spätminoisch IA am Beispiel der Siegelabdrücke aus Akrotiri (Thera). *AA* 1/2012: 1–14.

Argyrou-Brand 2014 — M. Argyrou-Brand. 2014. Die Beziehungen zwischen den Kykladen und Kreta am Beginn der spätminoischen Zeit. *PZ* 89: 116–32.

Arnold 1976 — D. Arnold. 1976. *Gräber des Alten und Mittleren Reiches in El-Tarif*. AV 17. Mainz (Philipp von Zabern).

Aruz 2008 — J. Aruz. 2008. *Marks of Distinction. Seals and Cultural Exchange between the Aegean and the Orient (ca. 2600-1360 B.C.). CMS* Beiheft 7. Mainz (Philipp von Zabern).

Athanasaki 2014 — K. Athanasaki. 2014. A serpentine quarry-scape in Gonies, north-central Crete. In G. Touchais – R. Laffineur – F. Rougemont (eds.), *Physis. L'environnement naturel et la relation homme-milieu dans le monde égéen protohistorique. Actes de la 14e rencontre égéenne internationale, Paris, Institut National d'Histoire de l'Art (INHA), 11–14 décembre 2012*. Aegaeum 37. Leuven – Liège (Peeters): 67–72.

Barber 1991 — E. J. W. Barber. 1991. *Prehistoric Textiles. The Development of Cloth in the Neolithic and Bronze Ages, with Special Reference to the Aegean*. Princeton (Princeton University Press).

Becker 1976 — M. J. Becker. 1976. Soft-stone sources on Crete. *JFA* 3: 361–74.

Becker 2011–12 — N. Becker. 2011–12. Attribution studies of golden signet rings: new efforts in tracing Aegean goldsmiths and their workshops. *AEA* 11: 73–88.

Bennet 2001 — J. Bennet. 2001. Agency and bureaucracy: thoughts on the nature and extent of administration in Bronze Age Pylos. In S. Voutsaki – J. Killen (eds.), *Economy and Politics in the Mycenaean Palace States, Proceedings of a Conference held on 1–3 July 1999 in the Faculty of Classics, Cambridge*. PCPS Suppl. 27. Cambridge (Cambridge Philological Society): 25–37.

Bennett 1950 — E. L. Bennett. 1950. Fractional quantities in Minoan bookkeeping. *AJA* 54: 204–22.

Benson 1956 — J. L. Benson. 1956. Aegean and Near Eastern seal impressions from Cyprus. In S. S. Weinberg (ed.), *The Aegean and the Near East, Studies presented to Hetty Goldman on the Occasion of her Seventy-Fifth Birthday*. New York (J. J. Augustin): 59–79.

Betts 1967 — J. H. Betts. 1967. New light on Minoan bureaucracy. A re-examination of some Cretan sealings. *Kadmos* 6: 15–40.

Betts 1981 — J. H. Betts. 1981. The Jasper Lion Master. In W.-D. Niemeier (ed.), *Studien zur minoischen und helladischen Glyptik. Beiträge zum 2. Marburger Siegel-Symposium, 26.–30. September 1978. CMS* Beiheft 1. Berlin (Gebrüder Mann): 1–15.

Betts 1989 — J. H. Betts. 1989. Seals of Middle Minoan III: chronology and technical revolution. In W. Müller (ed.), *Fragen und Probleme der bronzezeitlichen ägäischen Glyptik. Beiträge zum 3. Internationalen Marburger Siegel-Symposium, 5.–7. September 1985. CMS* Beiheft 3. Berlin (Gebrüder Mann): 1–17.

Beyer 2001 — D. Beyer. 2001. *Emar IV: les sceaux*. OBO Series Archaeologica 20. Freiburg/Göttingen (Vandenhoeck and Ruprecht).

Bichta 2003 — K. Bichta. 2003. Luxuria ex Oriente: ένα προϊστορικό ταξίδι από τη Θήρα στην Ανατολή. In A. Vlachopoulos – K. Birtacha (eds.), *Αργοναύτης. Τιμητικός τόμος για τον καθηγητή Χρίστο Γ. Ντούμα*. Athens (Η Καθημερινή): 542–53.

Bietak *et al.* 2007 — M. Bietak – N. Marinatos – C. Palyvou. 2007. *Taureador Scenes in Tell El-Dab'a (Avaris) and Knossos*. Denkschriften der Gesamtakademie 43. Vienna (Verlag der Österreichischen Akademie der Wissenschaften).

Birtacha 2008 — K. Birtacha. 2008. 'Cooking' installations in LC IA Akrotiri on Thera: a preliminary study of the 'kitchen' in Pillar Shaft 65. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation*. Cambridge (McDonald Institute for Archaeological Research): 349–76.

Birtacha *et al.* forthcoming — K. Birtacha – S. Sotiropoulou – V. Perdikatsis – C. Apostolaki. (forthcoming). Χρώματα. Νέα δεδομένα για τα υλικά, την επεξεργασία και τη χρήση τους στον προϊστορικό οικισμό του Ακρωτηρίου. In C. G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007.*

Blakolmer 2007 — F. Blakolmer. 2007. Vom Wandrelief in die Kleinkunst. Transformationen des Stierbildes in der minoisch-mykenischen Bildkunst. In F. Lang – C. Reinholdt – J. Weilhartner (eds.), *Στέφανος Αριστείος. Archäologische Forschungen zwischen Nil und Istros. Festschrift für Stefan Hiller zum 65. Geburtstag.* Vienna (Phoibos): 31–47.

Blakolmer 2008 — F. Blakolmer. 2008. Processions in Aegean iconography II: who are the participants? In L. A. Hitchcock – R. Laffineur – J. Crowley (eds.), *Dais. The Aegean Feast. Proceedings of the 12th International Aegean Conference/12e rencontre égéenne internationale, University of Melbourne, Centre for Classics and Archaeology, 25–29 March 2008*. Aegaeum 29. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 257–68.

Blakolmer 2010 — F. Blakolmer. 2010. Small is beautiful. The significance of Aegean glyptic for the study of wall paintings, relief frescoes and minor relief arts. In W. Müller (ed.), *Die Bedeutung der minoischen und mykenischen Glyptik. VI. Internationales Siegel-Symposium aus Anlass des 50 jährigen Bestehens des CMS. Marburg, 9.–12. October 2008. CMS* Beiheft 8. Mainz (Philipp von Zabern): 91–108.

Blakolmer 2013 — F. Blakolmer. 2013. Die Farbe Rot in Symbolik, Bildkunst und Sprache der bronzezeitlichen Ägäis. In H. Meller – C.-H. Wunderlich – F. Knoll (eds.), *Rot. Die Archäologie bekennt Farbe, 5. Mitteldeutscher Archäologentag vom 4. bis 6. Oktober 2012 in Halle (Saale), Tagungen des Landesmuseums für Vorgeschichte Halle* 10. Halle (Landesmuseum für Vorgeschichte): 275–86.

Blakolmer 2016 — F. Blakolmer. 2016. The 'minoanisation' of the arts in LC I Akrotiri and LH I Mycenae: similarities and differences. In J. Driessen (ed.), *RA-PI-NE-U. Studies on the Mycenaean World offered to Robert Laffineur for his 70th Birthday.* Aegis 10. Louvain-la-Neuve (Presses Universitaires de Louvain): 69–83.

Blegen – Rawson 1966 C. W. Blegen – M. Rawson. 1966. *The Palace of Nestor at Pylos in Western Messenia.* I. *The Buildings and their Contents.* Princeton (Princeton University Press).

Boardman 1997 J. Boardman. 1997. Greek seals. In D. Collon (ed.), *7000 Years of Seals*. London (British Museum Press): 74–87.

Boulotis 2005 C. Boulotis. 2005. Aspects of religious expression at Akrotiri. *ALS* 3: 20–75.

Boulotis 2008 C. Boulotis. 2008. Οι πινακίδες Γραμμικής Α από το Ακρωτήρι (THE 7–12): όψεις της οικονομικής ζωής του οικισμού. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Τριάντα χρόνια έρευνας 1967–1997, Επιστημονική συνάντηση 19–20 Δεκεμβρίου 1997.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 257. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 67–94.

Branigan 1981 K. Branigan. 1981. Minoan colonialism. *BSA* 76: 23–33.

Broodbank 2004 C. Broodbank. 2004. Minoanisation. *PCPS* 50: 46–91.

Burke 2003 B. Burke. 2003. The spherical loomweights. In P. A. Mountjoy (ed.), *Knossos. The South House*. *BSA* Supplementary Volume 34. London (British School at Athens): 195–97.

Burke 2006 B. Burke. 2006. Textile production at Petras: the evidence from House 2. In T. Detorakis – A. Kalokerinos (eds.), *Πεπραγμένα του Θ΄ Διεθνούς Κρητολογικού Συνεδρίου/Proceedings of the 9th International Cretological Conference, Elounda, 1–6 October 2001,* A1. Heraklion (Εταιρία Κρητικών Ιστορικών Μελετών): 280–95.

Burke 2010a B. Burke. 2010. Textiles. In E. H. Cline (ed.), *The Oxford Handbook of the Bronze Age Aegean (ca. 3000–1000 BC).* Oxford (Oxford University Press): 430–42.

Burke 2010b B. Burke. 2010. *From Minos to Midas. Ancient Cloth Production in the Aegean and in Anatolia.* Oxford – Oakville (Oxbow).

Cain 2001 C. D. Cain. 2001. Dancing in the dark: deconstructing a narrative of epiphany on the Isopata ring. *AJA* 105: 27–49.

Chapouthier 1930 F. Chapouthier. 1930. *Les écritures minoennes au palais de Mallia*. ÉtCrét 2. Paris (Librairie Orientaliste Paul Geuthner).

Chapouthier 1947–48 F. Chapouthier. 1947–48. Chronique de fouilles en 1946: Mallia. *BCH* 71–72: 405–06.

Chapouthier – Charbonneaux 1928 F. Chapouthier – J. Charbonneaux. 1928. *Fouilles exécutées à Mallia. Premier rapport (1922–1924).* ÉtCrét 1. Paris (Librairie Orientaliste Paul Geuthner).

Cherry 2009 J. Cherry. 2009. Sorting out Crete's Prepalatial off-island interactions. In W. A. Parkinson – M. L. Galaty (eds.), *Archaic State Interaction. The Eastern Mediterranean in the Bronze Age.* Santa Fe (School for Advanced Research Press): 107–40.

Cherry 2012 J. Cherry. 2012. Review of P. P. Betancourt, The Bronze Age begins: The Ceramics Revolution of Early Minoan I and the New Forms of Wealth that transformed Prehistoric Society. Philadelphia: INSTAP Academic

Press, 2008. *BMCR* 2012.04.17: http://bmcr.brynmawr.edu/2012/2012-04-17.html (accessed on 14/11/2017).

Christakis 2010 — K. S. Christakis. 2010. A wine offering to the Central Palace Sanctuary at Knossos: the evidence from KN Zb 27. In O. Krzyszkowska (ed.), *Cretan Offerings: Studies in Honour of Peter Warren*. *BSA* Studies 18. London (British School at Athens): 49–55.

Christakis 2011 — K. S. Christakis. 2011. Pithoi and economy in LM IB state societies. In T. M. Brogan – E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences. Acts of a Workshop held at the Danish Institute at Athens in Collaboration with the INSTAP Study Center for East Crete, 27-29 June 2007.* Monographs of the Danish Institute at Athens 11. Athens – Aarhus (Aarhus University Press): 241–53.

Collon 1987 — D. Collon. 1987. *First Impressions. Cylinder Seals in the Ancient Near East*. Chicago – London (British Museum Publications).

Collon 1994 — D. Collon. 1994. Bull-leaping in Syria. *ÄgLev* 4: 81–88.

Collon – Lehmann 2011 — D. Collon – M. Lehmann. 2011. Report on the sealings found in the 2009 excavations at Tell el-Dab'a. *ÄgLev* 21: 67–70.

Costin 1991 — C. L. Costin. 1991. Craft specialization: issues in defining, documenting, and explaining the organization of production. In M. B. Schiffer (ed.), *Archaeological Method and Theory* 3. Tucson (The University of Arizona Press): 1–56.

Crouwel 1981 — J. H. Crouwel. 1981. *Chariots and Other Means of Land Transport in Bronze Age Greece*. Amsterdam (Allard Pierson Museum).

Crouwel 2005 — J. H. Crouwel. 2005. Early chariots in the Aegean and their eastern connections. In R. Laffineur – E. Greco (eds.), *Emporia: Aegeans in the Central and Eastern Mediterranean. Proceedings of the 10th International Aegean Conference, Athens, Italian School of Archaeology, 14–18 April 2004*. Aegaeum 25. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 39–44.

Crowley 2013 — J. Crowley. 2013. *The Iconography of Aegean Seals*. Aegaeum 34. Leuven – Liège (Peeters).

Cutler 2012 — J. Cutler. 2012. Ariadne's thread: the adoption of Cretan weaving technology in the wider southern Aegean in the mid-second millennium BC. In M.-L. Nosch – R. Laffineur (eds.), *Kosmos. Jewellery, Adornment and Textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference / 13e rencontre égéenne internationale, University of Copenhagen, Danish National Research Foundation's Centre for Textile Research, 21 - 26 April 2010*. Aegaeum 33. Leuven – Liège (Peeters): 145–54.

D'Albiac 1995 — C. D'Albiac. 1995. The 'diagnostic' wings of monsters. In C. Morris (ed.), *Klados. Essays in Honour of J. N. Coldstream. BICS* Supplement 63. London (University of London, Institute of Classical Studies): 63–72.

Danielidou 1998 — D. Danielidou. 1998. *Η οκτώσχημη ασπίδα στο Αιγαίο της 2ης π.Χ. χιλιετίας. Μονογραφίες του Κέντρου Ερεύνης της Αρχαιότητος της Ακαδημίας Αθηνών 5*. Athens (Ακαδημία Αθηνών).

Davaras 1980 — C. Davaras. 1980. Une ancre minoenne sacrée? *BCH* 104: 47–71.

Davis 1977 — E. N. Davis. 1977. *The Vapheio Cups and Aegean Gold and Silver Ware*. New York – London (Garland).

Davis 1980 — J. L. Davis. 1980. Minoans and minoanization at Ayia Irini, Keos. In C. G. Doumas (ed.), *Thera and the Aegean World II. Papers presented at the Second International Scientific Congress, Santorini, Greece, August 1978*. London (Thera and the Aegean World): 257–60.

Davis 1984 — J. L. Davis. 1984. Cultural innovation and the Minoan thalassocracy at Ayia Irini, Keos. In R. Hägg – N. Marinatos (eds.), *The Minoan Thalassocracy. Myth and Reality. Proceedings of the Third International Symposium at the Swedish Institute in Athens, 31 May–5 June, 1982*. Gothenburg (Paul Åströms Förlag): 159–66.

Davis 1986 — E. N. Davis. 1986. Youth and age in the Thera frescoes. *AJA* 90: 399–466.

Davis *et al.* 1983 — J. L. Davis – E. Shofield – R. Torrence – D. F. Williams. 1983. Keos and the eastern Aegean: the Cretan connection. *Hesperia* 52: 361–66.

Davis – Gorogianni 2008 — J. L. Davis – E. Gorogianni. 2008. Potsherds from the edge: the construction of identities and the limits of minoanized areas of the Aegean. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation*. Cambridge (McDonald Institute for Archaeological Research): 339–48.

Davis – Stocker 2016 — J. L. Davis – S. R. Stocker. 2016. The lord of the gold rings. The griffin warrior of Pylos. *Hesperia* 85: 627–55.

De Graef 2016 — K. De Graef. 2016. Chercher la femme! The economic role of women in Old Babylonian Sippar. In B. Lion – C. Michel (eds.), *The Role of Women in Work and Society in the Ancient Near East*. SANER 13. Berlin (Walter de Gruyter): 270–95.

Dessenne 1957 — A. Dessenne. 1957. Le griffon créto-mycénien: inventaire et remarques. *BCH* 81: 203–15.

Detournay *et al.* 1980 — B. Detournay – J.-C. Poursat – F. Vandenabeele. 1980. *Fouilles exécutées à Mallia. Le Quartier Mu*. II. *Vases de pierre et de métal, vannerie, figurines et reliefs d'applique, éléments de parure et de décoration, armes, sceaux et empreintes*. ÉtCrét 26. Paris (École française d'Athènes).

Devetzi 2000 — A. Devetzi. 2000. The 'imported' stone vases at Akrotiri, Thera: a new approach to the material. *BSA* 95: 121–39.

Devetzi 2007 — A. Devetzi. 2007. Λίθινα. II. Λίθινα σκεύη. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Δυτική Οικία. Τράπεζες-Λίθινα-Μετάλλινα-Ποικίλα*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 246. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία): 113–60.

Devetzi 2008 — A. Devetzi. 2008. Akrotiri, Thera: stone vessels and implements of the Early Bronze Age. A preliminary report. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation*. Cambridge (McDonald Institute for Archaeological Research): 135–48.

Devetzi 2009–10 — A. Devetzi. 2009–10. Πίσω από την τέχνη. Τα χρώματα στο Ακρωτήρι Θήρας. *ALS* 7: 30–74.

Dimopoulou 1999 — N. Dimopoulou. 1999. The Neopalatial cemetery of the Knossian harbour-town at Poros: mortuary behaviour and social ranking. In *Eliten in der Bronzezeit. Ergebnisse zweier Kolloquien in Mainz und Athen*. Monographien des Römisch-Germanischen Zentralmuseums 43,1. Mainz (Verlag des Römisch-Germanischen Zentralmuseums): 27–36.

Dimopoulou 2010 — N. Dimopoulou. 2010. A gold discoid from Poros, Herakleion: the guard dog and the garden. In O. Krzyszkowska (ed.), *Cretan Offerings: Studies in Honour of Peter Warren. BSA* Studies 18. London (British School at Athens): 89–100.

Dionisio *et al.* 2014 — G. Dionisio – A. M. Jasink – J. Weingarten. 2014. *Minoan Cushion Seals. Innovation in Form, Style, and Use in Bronze Age Glyptic. Studia Archaeologica 196.* Rome (L'Erma di Bretschneider).

Diringer 1982 — D. Diringer. 1982. *The Book before Printing, Ancient, Medieval and Oriental.* New York (Dover Publications).

Dornan 2002 — J. L. Dornan. 2002. Agency and archaeology: past, present and future directions. *Journal of Archaeological Method and Theory* 9: 303–29.

Doumas 1974 — C. G. Doumas. 1974. Περί της μινωικής αρχιτεκτονικής εν Θήρα. *ArchEph* 113: 199–219.

Doumas 1978 — C. G. Doumas. 1978. The stratigraphy of Akrotiri. In C. G. Doumas (ed.), *Thera and the Aegean World* I. *Papers presented at the Second International Scientific Congress, Santorini, Greece, August 1978.* London (Thera and the Aegean World): 777–82.

Doumas 1983 — C. G. Doumas. 1983. *Thera. Pompeii of the Ancient Aegean*. London (Thames and Hudson).

Doumas 1987 — C. G. Doumas. 1987. Η Ξεστή 3 και οι κυανοκέφαλοι στην τέχνη της Θήρας. In L. Kastrinaki – G. Orfanou – N. Giannadakis (eds.), *Ειλαπίνη. Τόμος τιμητικός για τον καθηγητή Νικόλαο Πλάτωνα*. Heraklion (Βικελαία Δημοτική Βιβλιοθήκη): 151–59.

Doumas 1990 — C. G. Doumas. 1990. Archaeological observations at Akrotiri relating to the volcanic destruction. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,3. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* London (The Thera Foundation): 48–50.

Doumas 1992 — C. G. Doumas. 1992. *The Wall-Paintings of Thera*. Athens (Thera Foundation).

Doumas 2000a — C. G. Doumas. 2000. Age and gender in the Theran wall paintings. In S. Sherratt (ed.), *The Wall Paintings of Thera: Proceedings of the First International Symposium: Petros M. Nomikos Conference Centre Thera, Hellas, 30. August–4. September 1997.* Athens (Thera Foundation): 971–81.

Doumas 2000b — C. G. Doumas. 2000. Seal impressions from Akrotiri, Thera: a preliminary report. In W. Müller (ed.), *Minoisch-mykenische Glyptik. Stil, Ikonographie, Funktion. V. Internationales Siegel-Symposium, Marburg, 23.–25. September 1999. CMS* Beiheft 6. Berlin (Gebrüder Mann): 57–65.

Doumas 2005 — C. G. Doumas. 2005. La répartition topographique des fresques dans les bâtiments d'Akrotiri à Théra. In I. Bradfer-Burdet – B. Detournay – R. Laffineur (eds.), *Κρης τεχνίτης. L'artisan crétois: Recueil d'articles en l'honneur de Jean-Claude Poursat, publié à l'occasion des 40 ans de la découverte du Quartier Mu*. Aegaeum 26. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 73–81.

Doumas 2007a — C. G. Doumas (ed.). 2007. *Ακρωτήρι Θήρας. Δυτική Οικία. Τράπεζες-Λίθινα-Μετάλλινα-Ποικίλα*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 246. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Doumas 2007b — C. G. Doumas. 2007. Εισαγωγή. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Δυτική Οικία. Τράπεζες-Λίθινα-Μετάλλινα-Ποικίλα*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 246. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία): 24–46.

Doumas 2007c — C. G. Doumas. 2007. 40 Χρόνια. *ALS* 5: 6–45.

Doumas 2008 — C. G. Doumas. 2008. Chambers of mystery. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation*. Cambridge (McDonald Institute for Archaeological Research): 165–75.

Doumas 2009–10 — C. G. Doumas. 2009–10. Οι εργασίες στο Ακρωτήρι κατά τα έτη 2009 και 2010. *ALS* 7: 6–29.

Drakaki 2005–06 — E. Drakaki. 2005–06. The ownership of hard stone seals with the motif of a pair of recumbent bovines from the Late Bronze Age Greek mainland: a contextual approach. *AEA* 8: 81–93.

Driessen 1994–95 — J. Driessen. 1994–95. Data storage for reference and predition at the dawn of civilization? A review article with some observations on Archives before Writing. *Minos* 29–30: 239–56.

Driessen – Macdonald 1997 — J. Driessen – C. F. Macdonald. 1997. *The Troubled Island. Minoan Crete before and after the Santorini Eruption*. Aegeaum 17. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory).

Driver 1954 — G. R. Driver. 1954. *Aramaic Documents of the Fifth Century B.C.* Oxford (Clarendon Press).

Duru 2008 — R. Duru. 2008. *From 8000 BC to 2000 BC. Six Thousand Years of the Burdur-Antalya Region*. Antalya (Suna-İnan Kıraç Akdeniz Medeniyetleri Araştırma Enstitüsü).

Duru – Umurtak 2008 — R. Duru – G. Umurtak. 2008. Bademağacı kazıları. 2004, 2005 ve 2006 yılları çalışma raporu. Excavations at Bademağacı. A report of the campaigns of the years 2004, 2005 and 2006. *Belleten* 72.263: 193–250.

Eder 1994 — B. Eder. 1994. Die Frau in der Wirtschaft der mykenischen Paläste. In E. Specht (ed.), Frauenreichtum. *Die Frau als Wirtschaftsfaktor im Altertum*. Frauenforschung 27. Vienna (Wiener Frauenverlag): 45–71.

Efe 2007 — T. Efe. 2007. The theories of the 'Great Caravan Route' between Cilicia and Troy: the Early Bronze Age III period in inland western Anatolia. *AnatSt* 57: 47–64.

Einfalt 1978 — H.-C. Einfalt. 1978. Stone materials in ancient Akrotiri – A short compilation. In C.G. Doumas (ed.), *Thera and the Aegean World* I. *Papers presented at the Second International Scientific Congress, Santorini, Greece, August 1978*. London (Thera and the Aegean World): 523–27.

Evans 1899–1900 — A.J. Evans. 1899–1900. Knossos. Summary report of the excavations in 1900: I. The palace. *BSA* 6: 3–70.

Evans 1901 — A.J. Evans. 1901. Mycenaean tree and pillar cult and its Mediterranean relations. *JHS* 21: 99–204.

Evans 1909 — A.J. Evans. 1909. *Scripta Minoa. The Written Documents of Minoan Crete, with Special Reference to the Archives of Knossos*. I. *The Hieroglyphic and Primitive Linear Classes, with an Account of the Discovery of the Pre-Phoenician Scripts, their Place in Minoan Story and their Mediterranean Relations*. Oxford (Clarendon Press).

Evans 1921a — A.J. Evans. 1921. *The Palace of Minos: A Comparative Account of the Successive Stages of the Early Cretan Civilization as illustrated by the Discoveries at Knossos*, I. London (Macmillan and Co., Limited).

Evans 1921b — A.J. Evans. 1921. On a Minoan bronze group of a galloping bull and acrobatic figure from Crete. *JHS* 41: 247–59.

Evans 1922 — A.J. Evans. 1922. New discoveries at Knossos. *AntJ* 2: 319–29.

Evans 1928a — A.J. Evans. 1928. *The Palace of Minos: A Comparative Account of the Successive Stages of the Early Cretan Civilization as illustrated by the Discoveries at Knossos*, II,1. London (Macmillan and Co., Limited).

Evans 1928b — A.J. Evans. 1928. *The Palace of Minos: A Comparative Account of the Successive Stages of the Early Cretan Civilization as illustrated by the Discoveries at Knossos*, II,2. London (Macmillan and Co., Limited).

Evans 1930 — A.J. Evans. 1930. *The Palace of Minos: A Comparative Account of the Successive Stages of the Early Cretan Civilization as illustrated by the Discoveries at Knossos*, III. London (Macmillan and Co., Limited).

Evans 1935a — A.J. Evans. 1935. *The Palace of Minos: A Comparative Account of the Successive Stages of the Early Cretan Civilization as illustrated by the Discoveries at Knossos*, IV,1. London (Macmillan and Co., Limited).

Evans 1935b — A. J. Evans. 1935. *The Palace of Minos: A Comparative Account of the Successive Stages of the Early Cretan Civilization as illustrated by the Discoveries at Knossos*, IV,2. London (Macmillan and Co., Limited).

Evely 1984 — D. Evely. 1984. Loomweights. In M. R. Popham, *The Minoan Unexplored Mansion at Knossos.* Oxford (Thames and Hudson): 247–49.

Fiandra 1968 — E. Fiandra. 1968. A che cosa servivano le cretule di Festòs. In M. Panagiotaki (ed.), *Πεπραγμένα του Β΄ Διεθνούς Κρητολογικού Συνεδρίου/Proceedings of the Second International Cretological Congress, Chania 11–17 April 1966,* A. Athens (Φιλολογικός Σύλλογος «Ο Χρυσόστομος»): 383–97.

Firth 2016 — R. Firth. 2016. The clay cylinders from Room Δ17, Akrotiri, Thera: are they the remains of tally-sticks? *Minos* 39: 401–05.

Flouda 2010 — G. Flouda. 2010. Agency matters: seal-users in Pylian administration. *OJA* 29: 57–88.

Foster 2001 — A. L. Foster. 2001. Some Middle Kingdom sealing types from the Harvard-Boston expedition to Mirgissa, 1931–1932. *CRIPEL* 22, *Le sceau et l'administration dans la vallée du Nil, Villeneuve d'Ascq 7–8 juillet 2000*: 129–36.

Fotou 1997 — V. Fotou. 1997. Éléments d'analyse architecturale et la question des fonctions de trois bâtiments-'villas': la Royal Villa, le 'Mégaron' de Nirou et le 'Mégaron' de Sklavokambos. In R. Hägg (ed.), *The Function of the "Minoan Villa". Proceedings of the Eighth International Symposium at the Swedish Institute at Athens, 6–8 June 1992.* Acta Atheniensia 46. Stockholm (Paul Åströms Förlag): 33–50.

Fouqué 1879 — F. Fouqué. 1879. *Santorin et ses eruptions.* Paris (G. Masson).

Friedrich *et al.* 2006 — W. L. Friedrich – B. Kromer – M. Friedrich – J. Heinemeier – T. Pfeiffer – S. Talamo. 2006. Santorini eruption radiocarbon dated to 1627–1600 B.C. *Science* 312.5773: 548.

Friedrich 2009 — W. L. Friedrich. 2009. *Santorini – Volcano, Natural History, Mythology.* Aarhus – Lancaster – Oakville (Aarhus University Press).

Furtwängler – Löschcke 1886 — A. Furtwängler – G. Löschcke. 1886. *Mykenische Vasen. Vorhellenische Thongefässe aus dem Gebiete des Mittelmeeres* I. Berlin (A. Asher).

Furumark 1939 — A. Furumark. 1939. *Studies in Aegean Decorative Art. Antecedents and Sources of the Mycenaean Ceramic Decoration.* Stockholm (V. Pattersons).

Gell 1998 — A. Gell. 1998. *Art and Agency: An Anthropological Theory.* Oxford (Clarendon Press).

Georma *et al.* 2014 — F. Georma – A. Karnava – I. Nikolakopoulou. 2014. The natural world and its representations: a view from Akrotiri, Thera. In G. Touchais – R. Laffineur – F. Rougemont (eds.), *Physis. L'environnement naturel et la relation homme-milieu dans le monde égéen protohistorique. Actes de la 14e rencontre égéenne internationale, Paris, Institut National d'Histoire de l'Art (INHA), 11–14 décembre 2012.* Aegaeum 37. Leuven – Liège (Peeters): 175–82.

Girella – Pavúk 2015 L. Girella – P. Pavúk. 2015. Minoanisation, acculturation, hybridisation: the evidence of the Minoan presence in the north east Aegean between the Middle and Late Bronze Age. In N. S. Stampolidis – Ç. Maner – K. Kopanias (eds.), *Nostoi. Indigenous Culture, Migration and Integration in the Aegean Islands and Western Anatolia during the Late Bronze and Early Iron Age*. Istanbul (Koç University Press): 387–420.

Girella – Pavúk 2016 L. Girella – P. Pavúk. 2016. The nature of Minoan and Mycenaean involvement in the northeastern Aegean. In E. Gorogianni – P. Pavúk – L. Girella (eds.), *Beyond Thalassocracies. Understanding Processes of Minoanisation and Mycenaeanisation in the Aegean*. Oxford – Philadelphia (Oxbow): 15–42.

Glowacki – Vogeikoff-Brogan 2011 K.T. Glowacki – N. Vogeikoff-Brogan (eds.). 2011. *Στέγα: The Archaeology of Houses and Households in Ancient Crete. Hesperia* Supplement 44. Princeton (The American School of Classical Studies at Athens).

Goldwasser 2002 O. Goldwasser. 2002. *Lovers, Prophets and Giraffes - Wor[l]d Classification in Ancient Egypt*. Göttinger Orientforschungen 4, Reihe Ägypten 38. Wiesbaden (Harrassowitz).

Gorceix – Mamet 1870 H. Gorceix – H. Mamet. 1870. Fouilles à Santorin. *Bulletin de l'École française d'Athènes* 10: 187–91.

Goren – Panagiotopoulos 2009 Y. Goren – D. Panagiotopoulos. 2009. The 'Lords of the Rings': an analytical approach to the riddle of the 'Knossian replica rings'. *BICS* 52: 257–58.

Gorogianni *et al.* 2016 E. Gorogianni – P. Pavúk – L. Girella (eds.). 2016. *Beyond Thalassocracies. Understanding Processes of Minoanisation and Mycenaeanisation in the Aegean*. Oxford – Philadelphia (Oxbow.)

Grajetzki 2009 W. Grajetzki. 2009. Women and writing in the Middle Kingdom: Stela Louvre C 187. *RÉg* 60: 209–14.

Gratien 2001 B. Gratien. 2001. Scellements et contrescellements au Moyen Empire en Nubie. L'apport de Mirgissa. *CRIPEL* 22, *Le sceau et l'administration dans la vallée du Nil, Villeneuve d'Ascq 7–8 juillet 2000*: 47–69.

Günkel-Maschek 2012 U. Günkel-Maschek. 2012. Spirals, bulls, and sacred landscapes. In D. Panagiotopoulos – U. Günkel-Maschek (eds.), *Minoan Realities. Approaches to Images, Architecture, and Society in the Aegean Bronze Age*. Louvain-la-Neuve (Presses Universitaires de Louvain): 115–39.

Hägg – Marinatos 1984 R. Hägg – N. Marinatos (eds.). 1984. *The Minoan Thalassocracy. Myth and Reality. Proceedings of the Third International Symposium at the Swedish Institute in Athens, 31 May–5 June, 1982*. Gothenburg (Paul Åströms Förlag).

Hallager 1996 E. Hallager. 1996. *The Minoan Roundel and Other Sealed Documents in the Neopalatial Linear A Administration*. Aegaeum 14. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory).

Hallager 2000 — E. Hallager. 2000. New evidence for seal use in the Pre- and Protopalatial periods. In W. Müller (ed.), *Minoisch-mykenische Glyptik. Stil, Ikonographie, Funktion. V. Internationales Siegel-Symposium, Marburg, 23.–25. September 1999. CMS* Beiheft 6. Berlin (Gebrüder Mann): 97–105.

Hallager 2012 — E. Hallager. 2012. Literacy at Petras and three hitherto unpublished Linear A inscriptions. In M. Tsipopoulou (ed.), *Petras, Siteia – 25 Years of Excavations and Studies. Acts of a Two-Day Conference held at the Danish Institute at Athens, 9–10 October 2010.* Monographs of the Danish Institute at Athens 16. Athens (Aarhus University Press): 265–75.

Hallager – Hallager 1995 — B.P. Hallager – E. Hallager. 1995. The Knossian bull – political propaganda in Neo-palatial Crete? In R. Laffineur – W.-D. Niemeier (eds.), *Politeia. Society and State in the Aegean Bronze Age. Proceedings of the 5th International Aegean Conference/5e rencontre égéenne internationale, University of Heidelberg, Archäologisches Institut, 10–13 April 1994.* Aegaeum 12. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 547–55.

Haskell *et al.* 2011 — H.W. Haskell – R.E. Jones – P.M. Day – J.T. Killen. 2011. *Transport Stirrup Jars of the Bronze Age Aegean and East Mediterranean*. Prehistory Monographs 33. Philadelphia (INSTAP Academic Press).

Hawes *et al.* 1908 — H.B. Hawes – B.E. Williams – R.B. Seager – E.H. Hall. 1908. *Gournia, Vasiliki and Other Prehistoric Sites on the Isthmus of Hierapetra, Crete. Excavations of the Wells-Houston-Cramp Expeditions, 1901, 1903, 1904.* Philadelphia (American Exploration Society, Free Museum of Science and Art).

Heath 1958 — M.C. Heath. 1958. Early Helladic clay sealings from the House of the Tiles at Lerna. *Hesperia* 27: 81–121.

Heath Wiencke 1976 — M.C. Heath Wiencke. 1976. Clay sealings from Shechem, the Sudan, and the Aegean. *JNES* 35: 127–30.

Herbordt 1997 — S. Herbordt. 1997. Neo-Assyrian royal and administrative seals and their use. In H. Waetzoldt – H. Hauptmann (eds.), *Assyrien im Wandel der Zeiten, 39e rencontre assyriologique internationale, Heidelberg 6.–10. Juli 1992.* HSAO 6. Heidelberg (Heidelberger Orientverlag): 279–83.

Herbordt 2010 — S. Herbordt. 2010. The Hittite king and his court from the perspective of the sealed bullae from Hatusa. In W. Müller (ed.), *Die Bedeutung der minoischen und mykenischen Glyptik. VI. Internationales Siegel-Symposium aus Anlass des 50 jährigen Bestehens des CMS. Marburg, 9.–12. October 2008. CMS* Beiheft 8. Mainz (Philipp von Zabern): 213–24.

Hilditch 2014 — J. Hilditch. 2014. Analyzing technological standardization: revisiting the Minoan conical cup. In A. Kotsonas (ed.), *Understanding Standardization and Variation in Mediterranean Ceramics, Mid 2nd to late 1st millennium BC.* Leuven – Paris – Walpole (Peeters): 25–37.

Hitchcock – Nikolaidou 2013 — L. Hitchcock – M. Nikolaidou. 2013. Gender in Greek and Aegean prehistory. In D. Bolger (ed.), *A Companion to Gender Prehistory*. Hoboken (Wiley-Blackwell): 502–25.

Höflmayer 2012 — F. Höflmayer. 2012. The date of the Minoan Santorini eruption: quantifying the "offset". *Radiocarbon* 54: 435–48.

Hogarth 1900–01 — D. G. Hogarth. 1900–01. Excavations at Zakro, Crete. *BSA* 7: 121–49.

Hogarth 1902 — D. G. Hogarth. 1902. The Zakro sealings. *JHS* 22: 76–93.

Immerwahr 1990 — S. A. Immerwahr. 1990. Swallows and dolphins at Akrotiri: some thoughts on the relationship of vase-painting to wall-painting. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. M. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989*. London (The Thera Foundation): 237–45.

Jeffery 1961 — L. H. Jeffery. 1961. *The Local Scripts of Archaic Greece. A Study of the Origin of the Greek Alphabet and its Development from the Eighth to the Fifth Centuries B. C.* Oxford Monographs on Classical Archaeology. Oxford (Clarendon Press).

Jones *et al.* 2007 — R. E. Jones – V. Kilikoglou – V. Olive – Y. Bassiakos – R. Ellam – I. S. J. Bray – D. C. W. Sanderson. 2007. A new protocol for the chemical characterisation of steatite – two case studies in Europe: the Shetland Islands and Crete. *JAS* 34: 626–41.

Jursa 2005 — M. Jursa. 2005. *Neo-Babylonian Legal and Administrative Documents. Typology, Contents and Archives*. Guides to the Mesopotamian Textual Record 1. Münster (Ugarit-Verlag).

Kanta – Tzigounaki 2000 — A. Kanta – A. Tzigounaki. 2000. The Protopalatial multiple sealing system. New evidence from Monastiraki. In M. Perna (ed.), *Administrative Documents in the Aegean and their Near Eastern Counterparts. Proceedings of the International Colloquium, Naples, February 29–March 2, 1996*. Torino (Paravia Scriptorium): 193–210.

Kariotis 2003 — S. Kariotis. 2003. Ακρωτήρι Θήρας. Μια πρώτη ανάγνωση της στρωματογραφικής ακολουθίας στην Πλατεία Διπλών Κεράτων. In A. Vlachopoulos – K. Birtacha (eds.), *Αργοναύτης. Τιμητικός τόμος για τον καθηγητή Χρίστο Γ. Ντούμα*. Athens (Η Καθημερινή): 419–44.

Karnava 2000 — A. Karnava. 2000. The Cretan Hieroglyphic Script of the Second Millennium before our Times: Description, Analysis, Functions, and Decipherment Perspectives. Unpublished PhD thesis. Brussels (Free University of Brussels).

Karnava 2007–08 — A. Karnava. 2007–08. La minoicizzazione. In A. Sacconi – M. Del Freo – L. Godart – M. Negri (eds.), *Colloquium Romanum. Atti del XII colloquio internazionale di Micenologia, Roma 20–25 febbraio 2006*. Pasiphae I–II. Pisa–Rome (Fabrizio Serra Editore): 395–406.

Karnava 2008 — A. Karnava. 2008. Written and stamped records in the Late Bronze Age Cyclades: the sea journeys of an administration. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium*

on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation. Cambridge (McDonald Institute for Archaeological Research): 377–86.

Karnava 2011 — A. Karnava. 2011. The LM IA Cretan sealings from Akrotiri: chronological and historical implications. In L. Godart – M. Negri – A. Sacconi (eds.), *Atti del colloquio internazionale "Riflessioni sulla cronologia egea alla luce delle recenti scoperte di Santorini", Milano, 27–28 aprile 2009.* Pasiphae 4–2010. Pisa – Rome (Fabrizio Serra Editore): 87–91.

Karnava 2014a — A. Karnava. 2014. Les objets des fouilles de Gorceix et Mamet conservés à l'École française d'Athènes. In A. Boucher (ed.), *La Grèce des origines, entre rêve et archéologie. Musée d'Archéologie nationale – domaine national de Saint-Germain-en-Laye, 5 octobre 2014–19 janvier 2015.* Paris (Réunion des Musées Nationaux - Grand Palais): 42–47.

Karnava 2014b — A. Karnava. 2014. Les archives des fouilles Gorceix et Mamet. In A. Boucher (ed.), *La Grèce des origines, entre rêve et archéologie. Musée d'Archéologie nationale – domaine national de Saint-Germain-en-Laye, 5 octobre 2014–19 janvier 2015.* Paris (Réunion des Musées Nationaux - Grand Palais): 48–55.

Karnava 2016a — A. Karnava. 2016. Minoische Siegel: ein Fremdkörper in Akrotiri auf Thera. In G. Grabherr – B. Kainrath (eds.), *Akten des 15. Österreichischen Archäologentages in Innsbruck, 27. Februar–1. März 2014. Ikarus 9.* Innsbruck (Innsbruck University Press): 113–22.

Karnava 2016b — A. Karnava. 2016. On sacred vocabulary and religious dedications: the Minoan 'libation formula'. In E. Alram-Stern – F. Blakolmer – S. Deger-Jalkotzy – R. Laffineur – J. Weilhartner (eds.), *Metaphysis. Ritual, Myth and Symbolism in the Aegean Bronze Age, Proceedings of the 15th International Aegean Conference, Vienna, Institute for Oriental and European Archaeology, Aegean and Anatolia Department, Austrian Academy of Sciences and Institute of Classical Archaeology, University of Vienna, 22–25 April 2014.* Aegaeum 39. Leuven – Liège (Peeters): 345–55.

Karnava forthcoming a — A. Karnava. (forthcoming). Literacy in the Protopalatial period in Crete. In *Proceedings of the 11th Mycenological Colloquium, Austin, Texas, May 7–13, 2000. Hesperia* Supplement.

Karnava forthcoming b — A. Karnava. (forthcoming). Neopalatial document sealings: safe-keeping and archiving. In *Πεπραγμένα του ΙΑ΄ Διεθνούς Κρητολογικού Συνεδρίου/Proceedings of the 11th International Cretological Conference, Rethymno, 21–27 October 2011.*

Karnava forthcoming c — A. Karnava. (forthcoming). 4. Middle Cycladic spindle-whorls and loomweights. 4.2. The loomweights. The inscribed loomweight. In I. Nikolakopoulou (ed.), *Akrotiri, Thera. Middle Bronze Age. Pottery and Stratigraphy.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας.

Karnava – Blakolmer in preparation — A. Karnava – F. Blakolmer. (in preparation). Minoan document sealings in Neopalatial Crete and in Akrotiri, Thera: a new assessment of their administrative function, iconography and significance.

Karnava – Nikolakopoulou 2005 — A. Karnava – I. Nikolakopoulou. 2005. A pithos fragment with a Linear A inscription from Akrotiri, Thera. *SMEA* 47: 213–25.

Karo 1930 — G. Karo. 1930. *Die Schachtgräber von Mykenai.* Munich (F. Bruckmann AG).

Klengel-Brandt – Radner 1997 — E. Klengel-Brandt – K. Radner. 1997. Die Stadtbeamten von Assur und ihre Siegel. In S. Parpola – R. Whiting (eds.), *Assyria 1995.* Helsinki (Neo-Assyrian Text Corpus Project): 137–58.

Knappett 2002 — C. Knappett. 2002. Photographs, skeuomorphs and marionettes: some thoughts on mind, agency and object. *Journal of Material Culture* 7: 97–117.

Knappett 2008 — C. Knappett. 2008. Protopalatial Crete. The material culture. In C. W. Shelmerdine (ed.), *The Cambridge Companion to the Aegean Bronze Age.* Cambridge (Cambridge University Press): 121–39.

Knappett – Hilditch 2015a — C. Knappett – J. Hilditch. 2015. Colonial cups? The Minoan plain handleless cup as icon and index. In C. Glatz (ed.), *Plain Pottery Traditions of the Eastern Mediterranean and Near East: Production, Use, and Social Significance.* Walnut Creek (Left Coast Press): 91–113.

Knappett – Hilditch 2015b — C. Knappett – J. Hilditch. 2015. Milesian imports and exchange networks in the southern Aegean. In D. Panagiotopoulos – I. Kaiser – O. Kouka (eds.), *Ein Minoer im Exil, Festschrift für Wolf-Dietrich Niemeier.* Universitätsforschungen zur prähistorischen Archäologie aus dem Institut für Klassische Archäologie der Universität Heidelberg 270. Bonn (Habelt): 199–209.

Knappett – Nikolakopoulou 2005 — C. Knappett – I. Nikolakopoulou. 2005. Exchange and affiliation networks in the MBA southern Aegean: Crete, Akrotiri and Miletus. In R. Laffineur – E. Greco (eds.), *Emporia: Aegeans in the Central and Eastern Mediterranean. Proceedings of the 10th International Aegean Conference, Athens, Italian School of Archaeology, 14–18 April 2004.* Aegaeum 25. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 175–84.

Knappett – Nikolakopoulou 2008 — C. Knappett – I. Nikolakopoulou. 2008. Colonialism without colonies? A Bronze Age case study from Akrotiri, Thera. *Hesperia* 77: 1–42.

Koehl 1986 — R. B. Koehl. 1986. The Chieftain Cup and a Minoan rite of passage. *JHS* 106: 99–110.

Koehl 1990 — R. B. Koehl. 1990. The rhyta from Akrotiri and some preliminary observations on their functions and selected contexts. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* London (The Thera Foundation): 350–62.

Koehl 2006 — R. B. Koehl. 2006. *Aegean Bronze Age Rhyta*. Prehistory Monographs 19. Philadelphia (INSTAP Academic Press).

Koehl 2016 — R. B. Koehl. 2016. Beyond the 'Chieftain Cup': more images relating to Minoan male 'rites of passage'. In R. B. Koehl (ed.), *Studies in Aegean Art and Culture, A New York Aegean Bronze Age Colloquium in Memory of Ellen N. Davis*. Philadelphia (INSTAP Academic Press): 113–32.

Kotsonas 2014 — A. Kotsonas. 2014. Standardization, variation and the study of ceramics in the Mediterranean and beyond. In A. Kotsonas (ed.), *Understanding Standardization and Variation in Mediterranean Ceramics, Mid 2nd to late 1st Millennium BC*. Leuven – Paris – Walpole (Peeters): 7–23.

Kriga 2003a — D. Kriga. 2003. Μορφή και λειτουργία των αποθηκευτικών χωρών στις οικίες των αρχών της Ύστερης Εποχής του Χαλκού στον αιγαιακό χώρο (οικιστικές θέσεις στην Κρήτη, Ακρωτήρι Θήρας, Αγ. Ειρήνη Κέας). Η περίπτωση του Τομέα Α στο Ακρωτήρι Θήρας. Unpublished PhD thesis. Athens (University of Athens).

Kriga 2003b — D. Kriga. 2003. Οι ασάμινθοι στο Ακρωτήρι Θήρας. Σκέψεις για τις θέσεις ευρέσεως και τις χρήσεις των ασαμίνθων κατά την Ύστερη Εποχή του Χαλκού στο Αιγαίο. In A. Vlachopoulos – K. Birtacha (eds.), *Αργοναύτης. Τιμητικός τόμος για τον καθηγητή Χρίστο Γ. Ντούμα*. Athens (Η Καθημερινή): 461–82.

Krzyszkowska 2005a — O. Krzyszkowska. 2005. *Aegean Seals. An Introduction*. *BICS* Supplement 85. London (Institute of Classical Studies).

Krzyszkowska 2005b — O. Krzyszkowska. 2005. Travellers' tales: the circulation of seals in the Late Bronze Age Aegean. In R. Laffineur – E. Greco (eds.), *Emporia: Aegeans in the Central and Eastern Mediterranean. Proceedings of the 10th International Aegean Conference, Athens, Italian School of Archaeology, 14–18 April 2004*. Aegaeum 25. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 767–75.

Krzyszkowska 2010 — O. Krzyszkowska. 2010. Impressions of the natural world: landscape in Aegean glyptic. In O. Krzyszkowska (ed.), *Cretan Offerings: Studies in Honour of Peter Warren*. *BSA* Studies 18. London (British School at Athens): 169–87.

Krzyszkowska 2011 — O. Krzyszkowska. 2011. Seals and society in Bronze Age Crete. In M. Andreadaki-Vlazaki – E. Papadopoulou (eds.), *Πεπραγμένα του Ι΄ Διεθνούς Κρητολογικού Συνεδρίου, Χανιά 1–8 Οκτωβρίου 2006*, A1. Chania (Φιλολογικός Σύλλογος «Ο Χρυσόστομος»): 437–48.

Krzyszkowska 2014 — O. Krzyszkowska. 2014. Cutting to the chase: hunting in Minoan Crete. In G. Touchais – R. Laffineur – F. Rougemont (eds.), *Physis. L'environnement naturel et la relation homme-milieu dans le monde égéen protohistorique. Actes de la 14e rencontre égéenne internationale, Paris, Institut National d'Histoire de l'Art (INHA), 11–14 décembre 2012*. Aegaeum 37. Leuven – Liège (Peeters): 341–47.

Krzyszkowska 2016 — O. Krzyszkowska. 2016. Seal impression on amphora EMP 152. In M. Tsipopoulou (ed.), *Petras, Siteia* I. *A Minoan Palatial Settlement*

in Eastern Crete. Prehistory Monographs 53. New York (INSTAP Academic Press): 125–28.

Krzyszkowska 2017 — O. Krzyszkowska. 2017. Further seals from the cemetery at Petras. In M. Tsipopoulou (ed.), *Petras, Siteia. The Pre- and Proto-palatial Cemetery in Context, Acts of a Two-Day Conference held at the Danish Institute at Athens, 14–15 February 2015.* Monographs of the Danish Institute at Athens 21. Aarhus (Aarhus University Press): 143–57.

Lanaras forthcoming — V. Lanaras. (forthcoming). Αποθέσεις θεμελίωσης στο Ακρωτήρι Θήρας. In C. G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007.*

Latour 2000 — B. Latour. 2000. The Berlin key or how to do words with things. In P. Graves-Brown (ed.), *Matter, Materiality and Modern Culture*. London (Routledge): 10–21.

Lauinger 2011 — J. Lauinger. 2011. An excavated dossier of cuneiform tablets from Level VII in Alalaḫ? *BASOR* 362: 21–64.

Leach 1995 — B. Leach. 1995. Tanning tests for two documents written on animal skin. *JEA* 81: 241–43.

Lebessi *et al.* 2004 — A. Lebessi – P. Muhly – G. Papasavvas. 2004. The Runner's Ring, a Minoan athlete's dedication at the Syme sanctuary, Crete. *AM* 119: 1–31.

Leemans 1982 — W. F. Leemans. 1982. La fonction des sceaux, apposés à des contrats vieux-babyloniens. In G. van Driel – T. J. H. Krispijn – M. Stol – K. R. Veenhof (eds.), *Zikir Šumim, Assyriological Studies presented to F. R. Kraus on the Occasion of his Seventieth Birthday.* Studia Francisci Scholten Memoriae Dicata 5. Leiden (Brill): 219–44.

Levi 1925–26a — D. Levi. 1925–26. Le cretule di Haghia Triada. *ASAtene* 8–9: 71–156.

Levi 1925–26b — D. Levi. 1925–26. Le cretule di Zakro. *ASAtene* 8–9: 157–201.

Lewis 1994 — D. M. Lewis. 1994. The Persepolis tablets: speech, seal and script. In A. K. Bowman – G. Woolf (eds.), *Literacy and Power in the Ancient World*. Cambridge (Cambridge University Press): 17–32.

Littauer – Crouwel 1979 — M. A. Littauer – J. H. Crouwel. 1979. *Wheeled Vehicles and Ridden Animals in the Ancient Near East*. Leiden – Cologne (Brill).

Lolos 1990 — Y. G. Lolos. 1990. On the Late Helladic I of Akrotiri, Thera. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. M. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989*. London (The Thera Foundation): 51–56.

Luce 1978 — J. V. Luce. 1978. The chronology of the LM I destruction horizons in Thera and Crete. In C. G. Doumas (ed.), *Thera and the Aegean World* I. *Papers presented at the Second International Scientific Congress, Santorini, Greece, August 1978*. London (Thera and the Aegean World): 785–90.

Ma *et al.* 2013 — J. Ma – C. Tuplin – L. Allen. 2013. *The Arshama Letters from the Bodleian Library*, I. *Introduction*. Oxford: http://arshama.bodleian.ox.ac.uk/publications/ (accessed on 15/11/2017).

Macdonald 1990 — C. F. Macdonald. 1990. Destruction and construction in the palace at Knossos: LM IA–B. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,3. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* London (The Thera Foundation): 82–88.

Macdonald *et al.* 2009 — C. F. Macdonald – E. Hallager – W.-D. Niemeier (eds.). 2009. *The Minoans in the Central, Eastern and Northern Aegean – New Evidence, Acts of a Minoan Seminar 22–23 January 2005 in Collaboration with the Danish Institute at Athens and the German Archaeological Institute at Athens.* Monographs of the Danish Institute at Athens 8. Athens (Aarhus University Press).

Macdonald – Knappett 2013 — C. F. Macdonald – C. Knappett. 2013. Introduction. In C. F. Macdonald – C. Knappett (eds.), *Intermezzo. Intermediacy and Regeneration in Middle Minoan III Palatial Crete. BSA* Studies 21. London (British School at Athens): 1–7.

MacGillivray *et al.* 1999 — S. MacGillivray – H. Sackett – J. Driessen. 1999. 'Aspro Pato'. A lasting liquid toast from the master-builders of Palaikastro to their patron. In P. P. Betancourt – V. Karageorghis – R. Laffineur – W.-D. Niemeier (eds.), *Meletemata. Studies in Aegean Archaeology presented to Malcolm H. Wiener as he enters his 65th Year.* Aegaeum 20. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 465–68.

Maffre 1972 — J.-J. Maffre. 1972. Collection de l'École française d'Athènes. III. Céramique. I. Vases préhelléniques de Théra. *BCH* 96: 21–38.

Mamet – Gorceix 1870 — H. Mamet – H. Gorceix. 1870. Recherches et fouilles faites à Thera. *Bulletin de l'École française d'Athènes* 9: 183–86.

Maniatis 2012 — Y. Maniatis. 2012. Radiocarbon dating of the Late Cycladic building and destruction phases at Akrotiri, Thera: new evidence. *EPJ Plus* 127.9.

Maniki 2003 — A. Maniki. 2003. Κεφαλή πήλινου ειδωλίου από το Υστεροκυκλαδικό Ι Ακρωτήρι Θήρας. In A. Vlachopoulos – K. Birtacha (eds.), *Αργοναύτης. Τιμητικός τόμος για τον καθηγητή Χρίστο Γ. Ντούμα.* Athens (Η Καθημερινή): 483–89.

Maniki forthcoming — A. Maniki. (forthcoming). ΠΚ Ακρωτήρι. Η ταφική πρακτική του εγχυτρισμού. In C. G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007.*

Manning *et al.* 2014 — S. W. Manning – F. Höflmayer – N. Moeller – M. W. Dee – C. Bronk Ramsey – D. Fleitmann – T. Higham – W. Kutschera – E. M. Wild. 2014. Dating the Thera (Santorini) eruption: archaeological and scientific evidence supporting a high chronology. *Antiquity* 88.342: 1164–79.

Marinatos 1928 — S. Marinatos. 1928. Rekonstruktion des Stierreliefs von Knossos. *AA:* 102–12.

Marinatos 1939 — S. Marinatos. 1939. The volcanic destruction of Minoan Crete. *Antiquity* 13: 425–39.

Marinatos 1939–41 — S. Marinatos. 1939–41. Το μινωικόν μέγαρον Σκλαβοκάμπου. *ArchEph* 1939–41 (1948): 69–96.

Marinatos 1951 — S. Marinatos. 1951. Some general notes on the Minoan written documents. *Minos* 1: 39–42.

Marinatos 1990 — N. Marinatos. 1990. Minoan-Cycladic syncretism. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* London (The Thera Foundation): 370–77.

Marinatos 2007 — N. Marinatos. 2007. Proskynesis and Minoan theocracy. In F. Lang – C. Reinholdt – J. Weilhartner (eds.), *Στέφανος Αριστείος. Archäologische Forschungen zwischen Nil und Istros. Festschrift für Stefan Hiller zum 65. Geburtstag.* Vienna (Phoibos): 179–85.

Marinatos 2012 — N. Marinatos. 2012. A story of lions: palatial ideology in Egypt, Knossos, and Mycenae. In E. Mantzourani – P. P. Betancourt (eds.), *Philistor. Studies in Honor of Costis Davaras.* Prehistory Monographs 36. Philadelphia (INSTAP Academic Press): 113–17.

Marthari 1980 — M. E. Marthari. 1980. Ακρωτήρι, κεραμεική μεσοελλαδικής παράδοσης στο στρώμα της ηφαιστειακής καταστροφής. *ArchEph* 1980*:* 182–210.

Marthari 1984 — M. E. Marthari. 1984. The destruction of the town at Akrotiri, Thera, at the beginning of LC I: definition and chronology. In J. A. MacGillivray – R. L. N. Barber (eds.), *The Prehistoric Cyclades. Contributions to a Workshop on Cycladic Chronology.* Edinburgh (Department of Classical Archaeology): 119–33.

Marthari 1990 — M. E. Marthari. 1990. The chronology of the last phases of occupation at Akrotiri in the light of the evidence from the West House pottery groups. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,3. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* London (The Thera Foundation): 57–70.

Marthari 1993 — M. E. Marthari. 1993. Ακρωτήρι Θήρας. Η κεραμεική του στρώματος της ηφαιστειακής καταστροφής. Unpublished PhD thesis. Athens (University of Athens).

Marthari 1997 — M. E. Marthari. 1997. Από τον Σκάρκο στην Πολιόχνη: παρατηρήσεις για την κοινωνικο-οικονομική ανάπτυξη των οικισμών της Πρώιμης Εποχής Χαλκού στις Κυκλάδες και τα νησιά του Βορειοανατολικού Αιγαίου. In C. G. Doumas – V. La Rosa (eds.), *Poliochni e l'antica Età del Bronzo nell'Egeo settentrionale. Convegno internazionale, Atene, 22–25 Aprile 1996.* Athens (Scuola archeologica italiana di Atene): 362–82.

Marthari 2004 — M. E. Marthari. 2004. Ραός και Χαλαροβούνια. Τα πρώτα στοιχεία για δύο νέες θέσεις της Υστεροκυκλαδικής I περιόδου στη Θήρα/Raos and Chalarovounia. Preliminary evidence from two new sites of the Late Cycladic I period on Thera. *ALS* 2: 53–65.

Marthari 2009 — M. E. Marthari. 2009. An MM seal with a swallow motif from Knossos and its interconnections with late MC-LC I Theran iconography. In D. Danielidou (ed.), *Δώρον. Τιμητικός τόμος για τον καθηγητή Σπύρο Ιακωβίδη*. Μονογραφίες του Κέντρου Ερεύνης της Αρχαιότητος της Ακαδημίας Αθηνών 6. Athens (Ακαδημία Αθηνών): 419–38.

Marthari forthcoming — M. E. Marthari. (forthcoming). Από τα χελιδόνια στις οκτώσχημες ασπίδες. Ανιχνεύοντας το υπόστρωμα των ιδεών πίσω από την απεικόνιση του χελιδονιού στη θηραϊκή εικονογραφία. In C. G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007.*

Mathioudaki – Nikolakopoulou forthcoming — I. Mathioudaki – E. Nikolakopoulou. (forthcoming). Η ΥΜ ΙΑ κεραμεική από το συγκρότημα Δ στο Ακρωτήρι Θήρας. In *Πεπραγμένα του ΙΑ΄ Διεθνούς Κρητολογικού Συνεδρίου/Proceedings of the 11th International Cretological Conference, Rethymno, 21–27 October 2011.*

Matsas 1991 — D. Matsas. 1991. Samothrace and the northeastern Aegean: the Minoan connection. *Studia Troica* 1: 159–79.

Matsas 1995 — D. Matsas. 1995. Minoan long-distance trade: a view from the northern Aegean. In R. Laffineur – W.-D. Niemeier (eds.), *Politeia. Society and State in the Aegean Bronze Age. Proceedings of the 5th International Aegean Conference/5e rencontre égéenne internationale, University of Heidelberg, Archäologisches Institut, 10–13 April 1994.* Aegaeum 12. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 235–47.

Matsas 2009 — D. Matsas. 2009. The Minoans in Samothrace. In C. F. Macdonald (ed.), *The Minoans in the Central, Eastern and Northern Aegean. New Evidence: Acts of a Minoan Seminar 22–23 January 2005 in Collaboration with the Danish Institute at Athens and the German Archaeological Institute at Athens.* Monographs of the Danish Institute at Athens 8. Aarhus (Aarhus University Press): 251.

Michailidis – Angelidis 2006 — I. Michailidis – P. Angelidis. 2006. Οι συνθήκες διατήρησης των οργανικών υλικών φυτικής προέλευσης στον προϊστορικό οικισμό του Ακρωτηρίου Θήρας. *ALS* 4: 61–81.

Michailidou 1992–93 — A. Michailidou. 1992–93. 'Ostrakon' with Linear A script from Akrotiri (Thera). A non-bureaucratic activity? *Minos* 27–28: 7–24.

Michailidou 2001 — A. Michailidou. 2001. *Ακρωτήρι Θήρας. Η μελέτη των ορόφων στα κτήρια του οικισμού.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 212. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Michailidou 2006 — A. Michailidou. 2006. Stone balance weights? The evidence from Akrotiri on Thera. In M. E. Alberti – E. Ascalone – L. Peyronel (eds.), *Weights in Context: Bronze Age Weighing Systems of the Eastern Mediterranean. Chronology, Typology, Material and Archaeological Contexts. Proceedings of the International Colloquium Rome 22nd–24th November 2004, Istituto Italiano di Numismatica.* Studi e Materiali 13: Rome (Istituto italiano di numismatica): 233–63.

Michailidou 2008a — A. Michailidou. 2008. Μετάλλινα εργαλεία και σκεύη στα κτήρια του οικισμού. «Οικοσκευή» και κοινωνικές σχέσεις παραγωγής. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Τριάντα χρόνια έρευνας 1967–1997, Επιστημονική συνάντηση 19–20 Δεκεμβρίου 1997.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 257. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 17–33.

Michailidou 2008b — A. Michailidou. 2008b. *Weight and Value in Pre-Coinage Societies. II. Sidelights on Measurement from the Aegean and the Orient.* Μελετήματα 61. Athens (National Hellenic Research Foundation).

Mikrakis 2007 — M. Mikrakis. 2007. Wooden hand-shaped krotala from Akrotiri. *ALS* 5: 89–96.

Militello 2000 — P. Militello. 2000. L'archivio delle cretule in Vano 25 e un nuovo sigillo da Festòs. In M. Perna (ed.), *Administrative Documents in the Aegean and their Near Eastern Counterparts. Proceedings of the International Colloquium, Naples, February 29–March 2, 1996.* Torino (Paravia Scriptorium): 221–43.

Militello 2002 — P. Militello. 2002. A notebook by E. Stefani and the findspots of the Ayia Triada tablets. *CretAnt* 3: 111–20.

Militello 2012 — P. Militello. 2012. Ayia Triada tablets, findspots and scribes. A reappraisal. In E. Kyriakidis (ed.), *Proceedings of the International Colloquium "The Inner Workings of Mycenaean Bureaucracy", University of Kent, Canterbury, 19–21 September 2008. Pasiphae* 5–2011. Pisa – Rome (Fabrizio Serra Editore): 59–69.

Moeller *et al.* 2011 — N. Moeller – G. Marouard – N. Ayers. 2011. Discussion of late Middle Kingdom and early Second Intermediate Period history and chronology in relation to the Khyan sealings from Tell Edfu. *ÄgLev* 21: 87–121.

Morenz 2000 — L. D. Morenz. 2000. Stierspringen und die Sitte des Stierspieles im altmediterranen Raum. *ÄgLev* 10: 195–203.

Moschou – Karnava forthcoming — A. Moschou – A. Karnava. (forthcoming). Το βορειοδυτικό άκρο του οικισμού: Μια νέα γειτονιά στο προϊστορικό Ακρωτήρι. In C. G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007.*

Moundrea-Agrafioti 2007 — A. Moundrea-Agrafioti. 2007. Λίθινα. I. Λίθινα εργαλεία. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Δυτική Οικία. Τράπεζες-Λίθινα-Μετάλλινα-Ποικίλα.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 246. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία): 71–112.

Moundrea-Agrafioti 2008 — A. Moundrea-Agrafioti. 2008. Obsidian beyond technology? The 'cenotaphic' use of obsidian in the Pillar Shaft 17 area of Akrotiri, Thera. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation.* Cambridge (McDonald Institute for Archaeological Research): 177–82.

Mühlenbruch 2017 — T. Mühlenbruch. 2017. The absolute dating of the volcanic eruption of Santorini/Thera (periferia South Aegean/GR) – an alternative perspective. *PZ* 91: 92–107.

Müller 2000 W. Müller. 2000. Experimentelle Versuche mit zwei vom Fiedelbogen angetriebenen Geräten zur Bearbeitung von Siegelsteinen. In W. Müller (ed.), *Minoisch-mykenische Glyptik. Stil, Ikonographie, Funktion. V. Internationales Siegel-Symposium, Marburg, 23.–25. September 1999. CMS* Beiheft 6. Berlin (Gebrüder Mann): 195–202.

Müller 2005a W. Müller. 2005. Gold rings on Minoan fingers. In I. Bradfer-Burdet – B. Detournay – R. Laffineur (eds.), *Κρης τεχνίτης. L'artisan crétois: Recueil d'articles en l'honneur de Jean-Claude Poursat, publié à l'occasion des 40 ans de la découverte du Quartier Mu*. Aegaeum 26. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 171–76.

Müller 2005b W. Müller. 2005. Travelling sealings – evidence of emporia? In R. Laffineur – E. Greco (eds.), *Emporia: Aegeans in the Central and Eastern Mediterranean. Proceedings of the 10th International Aegean Conference, Athens, Italian School of Archaeology, 14–18 April 2004*. Aegaeum 25. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 785–90.

Müller 2015 M. Müller (ed.). 2015. *Household Studies in Complex Societies. (Micro) archaeological and Textual Approaches.* Oriental Institute Seminars 10. Chicago (Oriental Institute of the University of Chicago).

Mylonas-Shear 1998 I. Mylonas-Shear. 1998. Bellerophon tablets from the Mycenaean world? A tale of seven bronze hinges. *JHS* 118: 187–89.

Naveh – Shaked 2012 J. Naveh – S. Shaked (eds.). 2012. *Aramaic Documents from Ancient Bactria (Fourth Century BCE) from the Khalili Collections*. London (The Khalili Family Trust).

Nikolakopoulou 2002 I. Nikolakopoulou. 2002. Storage, Storage Facilities and Island Economy: The Evidence from LCI Akrotiri, Thera. Unpublished PhD thesis. Bristol (University of Bristol).

Nikolakopoulou 2003 I. Nikolakopoulou. 2003. Ακρωτήρι Θήρας. Η πόλη σε κατάσταση έκτακτης ανάγκης. In A. Vlachopoulos – K. Birtacha (eds.), *Αργοναύτης. Τιμητικός τόμος για τον καθηγητή Χρίστο Γ. Ντούμα.* Athens (Η Καθημερινή): 554–73.

Nikolakopoulou 2010 I. Nikolakopoulou. 2010. Middle Cycladic iconography: a social context for 'A new chapter in Aegean art'. In O. Krzyszkowska (ed.), *Cretan Offerings: Studies in Honour of Peter Warren. BSA Studies* 18. London (British School at Athens): 213–22.

Nikolakopoulou 2011 I. Nikolakopoulou. 2011. Remarks on storage and chronology in Late Cycladic I Akrotiri, Thera: a response to Kostis Christakis. In T. M. Brogan – E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences. Acts of a Workshop held at the Danish Institute at Athens in Collaboration with the INSTAP Study Center for East Crete, 27–29 June 2007.* Monographs of the Danish Institute at Athens 11. Athens (Aarhus University Press): 255–62.

Nikolakopoulou *et al.* 2008 I. Nikolakopoulou – F. Georma – A. Moschou – P. Sofianou. 2008. Trapped in the middle: new stratigraphic and ceramic evidence from Middle Cycladic Akrotiri, Thera. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation.* Cambridge (McDonald Institute for Archaeological Research): 311–24.

Nikolakopoulou forthcoming I. Nikolakopoulou. (forthcoming). *Akrotiri, Thera. Middle Bronze Age. Pottery and Stratigraphy.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας.

Nikolakopoulou – Knappett 2016 I. Nikolakopoulou – C. Knappett. 2016. Mobilities in the Neopalatial southern Aegean: the case of minoanisation. In E. Kiriatzi – C. Knappett (eds.), *Human Mobility and Technological Transfer in the Prehistoric Mediterranean. BSA* Studies in Greek Antiquity. Cambridge (Cambridge University Press): 102–15.

Notti 2011 E. Notti. 2011. The Theran epigraphic corpus of Linear A: geographical and chronological implications. In L. Godart – M. Negri – A. Sacconi (eds.), *Atti del colloquio internazionale "Riflessioni sulla cronologia egea alla luce delle recenti scoperte di Santorini", Milano, 27–28 aprile 2009. Pasiphae* 4–2010. Pisa – Rome (Fabrizio Serra Editore): 93–96.

Olivier 1967 J.-P. Olivier. 1967. *Les scribes de Cnossos. Essai de classement des archives d'un palais mycénien.* Incunabula Graeca XVII. Rome (Edizioni dell'Ateneo).

Olsen 2014 B. A. Olsen. 2014. *Women in Mycenaean Greece: The Linear B Tablets from Pylos and Knossos.* New York – London (Routledge).

Onassoglou 1985 A. Onassoglou. 1985. *Die ›talismanischen‹ Siegel. CMS* Beiheft 2. Berlin (Gebrüder Mann).

Palaima 1994 T. G. Palaima. 1994. Seal-users and script-users/nodules and tablets at LM IB Hagia Triada. In P. Ferioli – E. Fiandra – G. G. Fissore – M. Frangipane (eds.), *Archives Before Writing. Proceedings of the International Colloquium, Oriolo Romano, October 23–25, 1991.* Pubblicazioni del Centro Internazionale di Ricerche Archeologiche, Antropologiche e Storiche 1. Rome – Torino (Scriptorium): 307–37.

Palaima 2003 T. G. Palaima. 2003. 'Archives' and 'scribes' and information hierarchy in Mycenaean Greek Linear B records. In M. Brosius (ed.), *Ancient Archives and Archival Traditions. Concepts of Record-Keeping in the Ancient World.* Oxford (Oxford University Press): 153–94.

Palmer 1963 L. R. Palmer. 1963. The find-places of the Knossos tablets. In L. R. Palmer – J. Boardman, *On the Knossos Tablets.* Oxford (Oxford University Press): 1–251.

Palyvou 1984 C. Palyvou. 1984. The destruction of the town at Akrotiri, Thera at the beginning of LC I: rebuilding activities. In J. A. MacGillivray – R. L. N. Barber (eds.), *The Prehistoric Cyclades. Contributions to a Workshop on Cycladic Chronology.* Edinburgh (Department of Classical Archaeology): 134–47.

Palyvou 1999 — C. Palyvou. 1999. *Ακρωτήρι Θήρας. Η οικοδομική τέχνη*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 183. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Palyvou 2005 — C. Palyvou. 2005. *Akrotiri Thera. An Architecture of Affluence 3,500 Years Old*. Prehistory Monographs 15. Philadelphia (INSTAP Academic Press).

Panagiotakopulu *et al.* 2013 — E. Panagiotakopulu – T. Higham – A. Sarpaki – P. Buckland – C. G. Doumas. 2013. Ancient pests: the season of the Santorini Minoan volcanic eruption and a date from insect chitin. *Naturwissenschaften* 100: 683–89.

Panagiotopoulos 2002 — D. Panagiotopoulos. 2002. *Das Tholosgrab E von Phourni bei Archanes. Studien zu einem frühkretischen Grabfund und seinem kulturellen Kontext*. BAR-IS 1014. Oxford (Archaeopress).

Panagiotopoulos 2014 — D. Panagiotopoulos. 2014. *Mykenische Siegelpraxis. Funktion, Kontext und administrative Verwendung mykenischer Tonplomben auf dem griechischen Festland und Kreta*. Athenaia 5. Munich (Hirmer).

Panagiotopoulos 2015 — D. Panagiotopoulos. 2015. Sealing and 'exchange' in the Late Bronze Age Aegean and beyond. In B. Eder – R. Pruzsinszky (eds.), *Policies of Exchange. Political Systems and Modes of Interaction in the Aegean and the Near East in the 2nd Millennium B.C.E., Proceedings of the International Symposium at the University of Freiburg, Institute for Archaeological Studies, 30th May–2nd June 2012*. OREA 2. Vienna (Austrian Academy of Sciences Press): 277–91.

Panagiotopoulos – Goren 2008 — D. Panagiotopoulos – Y. Goren. 2008. Die Herren der Ringe. Was gesiegelte Tonplomben über das Herrschaftssystem des minoischen Kreta verraten. *Ruperto Carola* 3/08: 26–31.

Papadimitriou-Grammenou 2008 — A. Papadimitriou-Grammenou. 2008. Ακρωτήρι: Αποθήκευση ειδών διατροφής. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Τριάντα χρόνια έρευνας 1967–1997, Επιστημονική συνάντηση 19–20 Δεκεμβρίου 1997*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 257. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 137–50.

Papagiannopoulou 1991 — A. G. Papagiannopoulou. 1991. *The Influence of Middle Minoan Pottery on the Cyclades*. Gothenburg (Paul Åströms Förlag).

Papagiannopoulou 1995 — A. G. Papagiannopoulou. 1995. Xeste 3, Akrotiri, Thera: the pottery. In C. Morris (ed.), *Klados. Essays in Honour of J. N. Coldstream. BICS* Supplement 63. London (Institute of Classical Studies, University of London): 209–15.

Papagiannopoulou 2008 — A. G. Papagiannopoulou. 2008. From pots to pictures: Middle Cycladic figurative art from Akrotiri, Thera. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation*. Cambridge (McDonald Institute for Archaeological Research): 433–49.

Papapostolou 1977 — I. A. Papapostolou. 1977. *Τα σφραγίσματα των Χανίων. Συμβολή στη μελέτη της μινωικής σφραγιδογλυφίας*. Βιβλιοθήκη της εν Αθήναις

Αρχαιολογικής Εταιρείας 87. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Pape *et al.* 2014 — T. Pape – P. Halstead – J. Bennet – Y. Stangidis. 2014. 'For it is written': an experimental approach to the materiality and temporality of clay documents inscribed in Linear B. In Y. Galanakis – T. Wilkinson – J. Bennet (eds.), *Αθύρματα. Critical Essays on the Archaeology of the Eastern Mediterranean in Honour of E. Susan Sherratt*. Oxford (Archaeopress): 177–85.

Pelon 1982 — O. Pelon. 1982. L'épée à l'acrobate et la chronologie maliote. *BCH* 106: 165–90.

Pelon 1983 — O. Pelon. 1983. L'épée à l'acrobate et la chronologie maliote (II). *BCH* 107: 680–703.

Perna 2017 — M. Perna. 2017. Documents without writing: the case of the flat-based nodules. In A. M. Jasink – J. Weingarten – S. Ferrara (eds.), *Non-Scribal Communication Media in the Bronze Age Aegean and Surrounding Areas*. Periploi 9. Florence (Florence University Press): 159–66.

Perna *et al.* 2005 — M. Perna – A. Kanta – L. Tyree. 2005. An unpublished inscription in Linear A from the Skoteino Cave, Crete (SKO Zc 1). In M. Perna (ed.), *Studi in onore di Enrica Fiandra: Contributi di archeologia egea e vicinorientale*. Studi egei e vicinorientali 1. Naples – Paris (De Boccard): 321–33.

Picardo 2015 — N. Picardo. 2015. Hybrid households: institutional affiliations and household identity in the town of Wah-sut (South Abydos). In M. Müller (ed.), *Household Studies in Complex Societies. (Micro) Archaeological and Textual Approaches.* Oriental Institute Seminars 10. Chicago (Oriental Institute of the University of Chicago): 243–87.

Pilides 2000 — D. Pilides. 2000. *Pithoi of the Late Bronze Age in Cyprus. Types from the Major Sites of the Period*. Nicosia (Department of Antiquities, Cyprus).

Pini 1972 — I. Pini. 1972. Weitere Bemerkungen zu den minoischen Fussamuletten. *SMEA* 15: 179–87.

Pini 1983 — I. Pini. 1983. Neue Beobachtungen zu den tönernen Siegelabdrücken von Zakros. *AA* 1983: 559–72.

Pini 1984 — I. Pini. 1984. Minoische und helladische Tonsiegel. In Centre G. Glotz (ed.), *Aux origines de l'hellénisme, la Crète et la Grèce. Hommage à Henri van Effenterre*. Histoire ancienne et médiévale 15. Paris (Publications de la Sorbonne): 73–81.

Pini 1985 — I. Pini. 1985. Das Motiv des Löwenüberfalls in der spätminoischen und mykenischen Glyptik. In P. Darcque – J.-C. Poursat (eds.), *L'iconographie minoenne. Actes de la Table ronde d'Athènes (21–22 avril 1983). BCH* Supplement 11. Paris (De Boccard): 153–66.

Pini 1990 — I. Pini. 1990. The Hieroglyphic Deposit and the Temple Repositories at Knossos. In T. G. Palaima (ed.), *Aegean Seals, Sealings and Administration. Proceedings of the NEH-Dickson Conference of the Program in Aegean Scripts and Prehistory of the Department of Classics, University of Texas at Austin, January 11–13, 1989.* Aegaeum 5. Liège –

Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 33–60.

Pini 1998 — I. Pini. 1998. Minoan and Mycenaean decorated gold finger-rings. *BICS* 42: 210–11.

Pini 2006 — I. Pini. 2006. Look-alikes, copies and replicas. In T. Detorakis – A. Kalokerinos (eds.), *Πεπραγμένα του Θ΄ Διεθνούς Κρητολογικού Συνεδρίου/Proceedings of the 9th International Cretological Conference, Elounda, 1–6 October 2001,* A3. Heraklion (Εταιρία Κρητικών Ιστορικών Μελετών*)*: 219–30.

Pini 2007 — I. Pini. 2007. Die ‚Architekturmotive' in der MM-Glyptik. In F. Lang – C. Reinholdt – J. Weilhartner (eds.), *Στέφανος Αριστείος. Archäologische Forschungen zwischen Nil und Istros. Festschrift für Stefan Hiller zum 65. Geburtstag.* Vienna (Phoibos): 225–35.

Pini *et al.* 1997 — I. Pini – W. Müller – J.-P. Olivier – A. Sakellariou. 1997. *Die Tonplomben aus dem Nestorpalast von Pylos*. Mainz (Philipp von Zabern).

Platon 1971 — N. Platon. 1971. *Zakros. The Discovery of a Lost Palace of Ancient Crete*. New York (Charles Scribner's Sons).

Platon 2011 — L. Platon. 2011. Zakros: one or two destructions around the end of the LM IB period. In T. M. Brogan – E. Hallager (eds.), *LM IB Pottery. Relative Chronology and Regional Differences. Acts of a Workshop held at the Danish Institute at Athens in Collaboration with the INSTAP Study Center for East Crete, 27–29 June 2007.* Monographs of the Danish Institute at Athens 11. Athens (Danish Institute at Athens): 595–612.

Platon – Brice 1975 — N. Platon – W.C. Brice. 1975. *Ενεπίγραφοι πινακίδες και πίθοι Γραμμικού συστήματος Α εκ Ζάκρου/Inscribed Tablets and Pithos of Linear A System from Zakro.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 85. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Polychronakou-Sgouritsa 2000 — N. Polychronakou-Sgouritsa. 2000. Αποθήκευση και φύλαξη αγαθών στον ΥΚ Ι οικισμό του Ακρωτηρίου Θήρας. *ArchEph* 139: 65–94.

Polychronakou-Sgouritsa 2008 — N. Polychronakou-Sgouritsa. 2008. Πρόσφατα στοιχεία αποθήκευσης και διαφύλαξης αγαθών στον ΥΚ Ι οικισμό του Ακρωτηρίου Θήρας. In C.G. Doumas (ed.), *Ακρωτήρι Θήρας. Τριάντα χρόνια έρευνας 1967–1997, Επιστημονική συνάντηση 19–20 Δεκεμβρίου 1997.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 257. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 151–67.

Postgate 2013 — N. Postgate. 2013. *Bronze Age bureaucracy. Writing and the practice of government in Assyria*. Cambridge (Cambridge University Press).

Poursat 1990a — J.-C. Poursat. 1990. Craftsmen and traders at Thera: a view from Crete. In C.G. Doumas – D.A. Hardy – J.A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* London (The Thera Foundation): 124–27.

Poursat 1990b — J.-C. Poursat. 1990. Hieroglyphic documents and sealings from Mallia, Quartier Mu: a functional analysis. In T. G. Palaima (ed.), *Aegean Seals, Sealings and Administration. Proceedings of the NEH-Dickson Conference of the Program in Aegean Scripts and Prehistory of the Department of Classics, University of Texas at Austin, January 11–13, 1989.* Aegaeum 5. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 25–29.

Poursat 2001 — J.-C. Poursat. 2001. «Marques de potier» et contrôle économique à Malia à l'époque des premiers palais crétois. *KTEMA* 26: 25–30.

Poursat 2013 — J.-C. Poursat. 2013. *Fouilles exécutées à Malia. Le Quartier Mu.* V. *Vie quotidienne et techniques au Minoen Moyen II.* ÉtCrét 34. Paris (École française d'Athènes).

Poursat *et al.* 1978 — J.-C. Poursat – L. Godart – J.-P. Olivier. 1978. *Fouilles exécutées à Mallia. Le Quartier Mu.* I. *Introduction générale. Écriture hiéroglyphique crétoise*. ÉtCrét 23. Paris (École française d'Athènes).

Poursat – Knappett 2005 — J.-C. Poursat – C. Knappett. 2005. *Fouilles exécutées à Malia. Le Quartier Mu* IV. *La poterie du Minoen Moyen II: production et utilisation.* ÉtCrét 33. Athens (École française d'Athènes).

Poursat – Olivier 1996 — J.-C. Poursat – J.-P. Olivier. 1996. *Fouilles exécutées à Malia. Le Quartier Mu* III. *Artisans minoens: Les maisons-ateliers du Quartier Mu*. EtCrét 32. Paris (École française d'Athènes).

Pullen 1994 — D. J. Pullen. 1994. A lead seal from Tsoungiza, ancient Nemea, and Early Bronze Age Aegean sealing systems. *AJA* 98: 35–52.

Radner 2008 — K. Radner. 2008. The delegation of power: Neo-Assyrian bureau seals. In P. Briant – W. F. M. Henkelman – M. W. Stolper (eds.), *L'archive des Fortifications de Persépolis. État des questions et perspectives de recherches. Actes du colloque organisé au Collège de France par la «Chaire d'histoire et civilisation du monde achéménide et de l'empire d'Alexandre» et le «Réseau international d'études et des recherches achéménides» (GDR 2538 CNRS), 3–4 novembre 2006.* Persika 12. Paris (De Boccard): 481–515.

Radner 2014 — K. Radner. 2014. An imperial communication network: the state correspondence of the Neo-Assyrian empire. In K. Radner (ed.), *State Correspondence in the Ancient World, from New Kingdom Egypt to the Roman Empire*. Oxford (Oxford University Press): 64–93.

Reed 1972 — R. Reed. 1972. *Ancient Skins, Parchments and Leathers*. New York – London (Seminar Press).

Reisner 1955 — G. A. Reisner. 1955. Clay sealings of Dynasty XIII from Uronarti fort. *Kush* 3: 26–69.

Relaki 2009 — M. Relaki. 2009. Rethinking administration and seal use in third millennium Crete. *CretAnt* 10/II: 353–72.

Relaki 2012 — M. Relaki. 2012. The social arenas of tradition. Investigating collective and individual social strategies in the Prepalatial and Protopalatial

Mesara. In I. Schoep – P. Tomkins – J. Driessen (eds.), *Back to the Beginning. Reassessing Social and Political Complexity on Crete during the Early and Middle Bronze Age*. Oxford (Oxbow): 290–324.

Renaudin 1922 — L. Renaudin. 1922. Vases préhelléniques de Théra, à l'École française d'Athènes. *BCH* 46: 113–59.

Renfrew 1964 — C. Renfrew. 1964. Crete and the Cyclades before Rhadamanthus. *CretChron* 18: 134–41.

Renfrew 1972 — C. Renfrew. 1972. *The Emergence of Civilisation. The Cyclades and the Aegean in the Third Millennium B.C.* London (Methuen).

Renfrew *et al.* 2007 — C. Renfrew – N. Brodie – C. Morris – C. Scarre (eds.). 2007. *Excavations at Phylakopi in Melos 1974–77. BSA* Supplementary Volume 42. London (British School at Athens).

Renger 1977 — J. M. Renger. 1977. Legal aspects of sealing in ancient Mesopotamia. In M. Gibson – R. D. Biggs (eds.), *Seals and Sealing in the Ancient Near East*. Bibliotheca Mesopotamica 6. Malibu (Undena Publications): 75–88.

Root 1999 — M. C. Root. 1999. The cylinder seal from Pasargadae: of wings and wheels, date and fate. *IrAnt* 34: 157–90.

Rougemont – Olivier 1998 — F. Rougemont – J.-P. Olivier (eds.). 1998. Recherches récentes en épigraphie créto-mycénienne. *BCH* 122: 403–43.

Şahoğlu 2008 — V. Şahoğlu. 2008. Liman Tepe and Bakla Tepe: new evidence for the relations between the İzmir region, the Cyclades and the Greek mainland during the late fourth and third millennia BC. In H. Erkanal – H. Hauptmann – V. Şahoğlu – R. Tuncel (eds.), *Proceedings of the International Symposium The Aegean in the Neolithic, Chalcolithic and the Early Bronze Age, October 13th–19th 1997, Urla – İzmir (Turkey)*. Ankara (Ankara Üniversitesi Basımevi): 483–501.

Şahoğlu – Sotirakopoulou 2011 — V. Şahoğlu – P. I. Sotirakopoulou (eds.). 2011. *Across: The Cyclades and Western Anatolia during the 3rd Millennium BC*. Istanbul (Sabancı University Sakıp Sabancı Museum).

Sakellarakis 1972 — Y. A. Sakellarakis. 1972. Το προσχέδιον της σφραγίδος CMS I 220 εκ Βαφειού. *ArchEph* 1972: 234–44.

Sakellarakis 1981 — Y. A. Sakellarakis. 1981. Matrizen zur Herstellung kretisch-mykenischer Siegelringe. In W.-D. Niemeier (ed.), *Studien zur minoischen und helladischen Glyptik. Beiträge zum 2. Marburger Siegel-Symposium, 26.–30. September 1978. CMS* Beiheft 1. Berlin (Gebrüder Mann): 167–79.

Sakellarakis 1990 — J. A. Sakellarakis. 1990. The fashioning of ostrich-egg rhyta in the Creto-Mycenaean Aegean. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989*. London (The Thera Foundation): 285–308.

Sakellarakis – Sapouna-Sakellaraki 1997 — Y. Sakellarakis – E. Sapouna-Sakellaraki. 1997. *Αρχάνες: Μια νέα ματιά στη μινωική Κρήτη*. Athens (Άμμος).

Sbonias 1995 — K. Sbonias. 1995. *Frühkretische Siegel. Ansätze für eine Interpretation der sozial-politischen Entwicklung auf Kreta während der Frühbronzezeit.* BAR-IS 620. Oxford (Archaeopress).

Sbonias 1999 — K. Sbonias. 1999. Social development, management of production, and symbolic representation in Prepalatial Crete. In A. Chaniotis (ed.), *From Minoan Farmers to Roman Traders. Sidelights on the Economy of Ancient Crete*. Stuttgart (Steiner): 25–51.

Sbonias 2000 — K. Sbonias. 2000. Specialisation in the Early Minoan seal manufacture: craftsmen, settlements and the organisation of production. In W. Müller (ed.), *Minoisch-mykenische Glyptik. Stil, Ikonographie, Funktion. V. Internationales Siegel-Symposium, Marburg, 23.–25. September 1999. CMS* Beiheft 6. Berlin (Gebrüder Mann): 277–93.

Sbonias 2010 — K. Sbonias. 2010. Seals from the cemetery. In A. Vasilakis – K. Branigan (eds.), *Moni Odigitria. A Prepalatial Cemetery and its Environs in the Asterousia, Southern Crete.* Prehistory Monographs 30. Philadelphia (INSTAP Academic Press): 201–25.

Schiering 1984 — W. Schiering. 1984. Bemerkungen zu den sogenannten architektonischen Motiven der minoischen Siegelkunst. In Centre G. Glotz (ed.), *Aux origines de l'hellénisme, la Crète et la Grèce. Hommage à Henri van Effenterre*. Histoire ancienne et médiévale 15. Paris (Publications de la Sorbonne): 65–71.

Schmandt-Besserat 1992 — D. Schmandt-Besserat. 1992. *Before Writing.* I: *From Counting to Cuneiform*. Austin (University of Texas Press).

Schoep 1999a — I. Schoep. 1999. The origins of writing and administration on Crete. *OJA* 18: 265–76.

Schoep 1999b — I. Schoep. 1999. Tablets and territories? Reconstructing Late Minoan IB political geography through undeciphered documents. *AJA* 103: 201–21.

Schoep 2001 — I. Schoep. 2001. Some notes of the "Hieroglyphic" Deposit from Knossos. *SMEA* 43: 143–58.

Schoep *et al.* 2012 — I. Schoep – P. Tomkins – J. Driessen (eds.). 2012. *Back to the Beginning. Reassessing Social and Political Complexity on Crete during the Early and Middle Bronze Age*. Oxford (Oxbow).

Schofield 1982 — E. Schofield. 1982. The western Cyclades and Crete: a 'special relationship'. *OJA* 1: 9–25.

Shank 2013 — E. Shank. 2013. The griffin motif – an evolutionary tale. In A. Vlachopoulos (ed.), *Paintbrushes, Wall-Painting and Vase-Painting of the 2nd Millennium BC in Dialogue, Summaries – Χρωστήρες, Η τοιχογραφία και η αγγειογραφία της 2ης χιλιετίας π.Χ. σε διάλογο, Περιλήψεις*. Athens (Εταιρεία Στήριξης Σπουδών Προϊστορικής Θήρας): 87–89.

Shapland 2010a — A. Shapland. 2010. The Minoan lion: presence and absence on Bronze Age Crete. *WorldArch* 42: 273–89.

Shapland 2010b — A. Shapland. 2010. Wild nature? Human–animal relations on Neopalatial Crete. *CAJ* 20: 109–27.

Shapland 2013 — A. Shapland. 2013. Jumping to conclusions: bull-leaping in Minoan Crete. *Society and Animals* 21: 194–207.

Shelmerdine 2016 — C. W. Shelmerdine. 2016. Women in the Mycenaean economy. In S. L. Budin – J. M. Turfa (eds.), *Women in Antiquity. Real Women across the Ancient World*. London – New York (Routledge): 618–34.

Shelmerdine 2017 — C. W. Shelmerdine. 2017. Exceptional women: female roles and power in the Linear B tablets. In M.-L. Nosch – H. Landenius Enegren (eds.), *Aegean Scripts. Proceedings of the 14th International Colloquium on Mycenaean Studies, Copenhagen, 2–5 September 2015*. Incunabula Graeca 105,1. Rome (CNR Edizioni): 363–80.

Sherbiny 2017a — W. Sherbiny. 2017. The so-called Book of Two Ways on a Middle Kingdom religious leather roll. In G. Rosati – M. C. Guidotti (eds.), *Proceedings of the XI International Congress of Egyptologists, Florence Egyptian Museum, Florence, 23–30 August 2015*. Archaeopress Egyptology 19. Oxford (Archaeopress): 590–92.

Sherbiny 2017b — W. Sherbiny. 2017. *Through Hermopolitan Lenses. Studies of the So-Called Book of Two Ways in Ancient Egypt*. Leiden (Brill).

Sherratt 2000 — S. Sherratt (ed.). 2000. *The Wall Paintings of Thera, Proceedings of the First International Symposium 30 August–4 September 1997*. Athens (Thera Foundation).

Sipahi 2001 — T. Sipahi. 2001. New evidence from Anatolia regarding bull leaping scenes in the art of the Aegean and the Near East. *Anatolica* 27: 107–25.

Sjöquist – Åström 1991 — K.-E. Sjöquist – P. Åström. 1991. *Knossos: Keepers and Kneaders*. SIMA-PB 82. Gothenburg (Paul Åströms Förlag).

Smith 1990 — S. T. Smith. 1990. Administration at the Egyptian Middle Kingdom frontier: sealings from Uronarti and Askut. In T. G. Palaima (ed.), *Aegean Seals, Sealings and Administration. Proceedings of the NEH-Dickson Conference of the Program in Aegean Scripts and Prehistory of the Department of Classics, University of Texas at Austin, January 11–13, 1989*. Aegaeum 5. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 197–219.

Sofianou – Brogan 2010 — C. Sofianou – T. M. Brogan. 2010. Μινωικός οικισμός Παπαδιόκαμπου Σητείας. Η ανασκαφή της Οικίας Β.1 κατά το 2008. In M. Andrianakis – I. Tzachili (eds.), *Αρχαιολογικό Έργο Κρήτης* 1. *Πρακτικά της 1ης συνάντησης, Ρέθυμνο, 28–30 Νοεμβρίου 2008*. Rethymno (Φιλοσοφική Σχολή Πανεπιστημίου Κρήτης): 134–42.

Sofianou – Georma forthcoming — P. Sofianou – F. Georma. (forthcoming). Υπαίθριοι χώροι και αποχετευτικό σύστημα: μία διαχρονική προσέγγιση βάσει των νέων στρωματογραφικών δεδομένων. In C. G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007*.

Sotirakopoulou 1999 — P. I. Sotirakopoulou. 1999. *Ακρωτήρι Θήρας. Η Νεολιθική και η Πρώιμη Εποχή του Χαλκού επί τη βάση της κεραμεικής*. Βιβλιοθήκη

της εν Αθήναις Αρχαιολογικής Εταιρείας 191. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Sotirakopoulou 2008 — P. I. Sotirakopoulou. 2008. Akrotiri, Thera: the late Neolithic and Early Bronze Age phases in the light of recent excavations at the site. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation*. Cambridge (McDonald Institute for Archaeological Research): 121–34.

Stol 2016 — M. Stol. 2016. *Women in the Ancient Near East*. Boston – Berlin (De Gruyter).

Tallet 2017 — P. Tallet. 2017. *Les papyrus de la Mer Rouge I. Le «Journal de Merer» (Papyrus Jarf A et B)*. Cairo (Institut français d'archéologie orientale du Caire).

Tallet – Marouard 2014 — P. Tallet – G. Marouard. 2014. The Harbor of Khufu on the Red Sea Coast at Wadi al-Jarf, Egypt. *NEA* 77: 4–14.

Televantou 1984 — C. Televantou. 1984. Κοσμήματα από την προϊστορική Θήρα. *ArchEph* 1984 (1986): 14–54.

Televantou 1994 — C. Televantou. 1994. *Ακρωτήρι Θήρας. Οι τοιχογραφίες της Δυτικής Οικίας*. Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 143. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Televantou 2000 — C. Televantou. 2000. Aegean Bronze Age wall painting: the Theran workshop. In S. Sherratt (ed.), *The Wall Paintings of Thera, Proceedings of the First International Symposium 30 August–4 September 1997*. Athens (The Thera Foundation): 831–43.

Themelis 1979 — P. Themelis. 1979. Ausgrabungen in Kallipolis (Ost-Aetolien) 1977–1978. *AAA* 12: 245–79.

Treuil 2008 — R. Treuil. 2008. Chapitre VI – L'éruption du volcan de Théra (Santorin). In R. Treuil – P. Darcque – J.-C. Poursat – G. Touchais (eds.), *Les civilisations égéennes du Néolithique et de l'Âge du Bronze*. Paris (Presses Universitaires de France): 291–305.

Treuil *et al.* 2008 — R. Treuil – P. Darcque – J.-C. Poursat – G. Touchais (eds.). 2008. *Les civilisations égéennes du Néolithique et de l'Âge du Bronze*. 2nd ed. Paris (Presses Universitaires de France).

Tsangaraki 2006 — E. Tsangaraki. 2006. *Σφραγίσματα με παραστάσεις ανθρώπινων μορφών: Συμβολή στη μελέτη του διοικητικού συστήματος της νεοανακτορικής Κρήτης*. Κρητική Εστία 11. Chania (Ιστορική, Λαογραφική και Αρχαιολογική Εταιρεία Κρήτης).

Tsangaraki 2010a — E. Tsangaraki. 2010. Ο ρόλος της σφραγιστικής εικονογραφίας στο διοικητικό σύστημα της νεοανακτορικής Κρήτης: η περίπτωση των σφραγισμάτων με σκηνές ταυροκαθαψίων. In N. Μερούσης – Ε. Στεφανή – Μ. Νικολαΐδου (eds.), *Ίρις. Μελέτες στη μνήμη της καθηγήτριας Αγγελικής Πιλάλη-Παπαστερίου από τους μαθητές της στο Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης*. Thessaloniki (Σφακιανάκη Κορνηλία): 305–26.

Tsangaraki 2010b — E. Tsangaraki. 2010. Sealings with representation of human figures: a Neoapalatial repertoire and its significance in the administrative system. In W. Müller (ed.), *Die Bedeutung der minoischen und mykenischen Glyptik. VI. Internationales Siegel-Symposium aus Anlass des 50 jährigen Bestehens des CMS. Marburg, 9.–12. October 2008. CMS* Beiheft 8. Mainz (Philipp von Zabern): 363–81.

Tsipopoulou – Hallager 1996 — M. Tsipopoulou – E. Hallager. 1996. Inscriptions with hieroglyphs and Linear A from Petras, Siteia. *SMEA* 37: 7–46.

Tsipopoulou – Hallager 2010 — M. Tsipopoulou – E. Hallager. 2010. *The Hieroglyphic Archive at Petras, Siteia*. Monographs of the Danish Institute at Athens 9. Athens – Aarhus (Aarhus University Press).

Tsoulakou forthcoming — M. Tsoulakou. (forthcoming). Φρέαρ 67. Μια βαθειά στρωματογραφική τομή στην ιστορία της πόλης του Ακρωτηρίου. In C. G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007.*

Tsouparopoulou 2014 — C. Tsouparopoulou. 2014. Progress report: an online database for the documentation of seals, sealings, and seal impressions in the ancient Near East. *StOrE* 2: 37–68.

Tzachili 1990 — I. Tzachili. 1990. All important yet elusive: looking for evidence of cloth-making at Akrotiri. In C. G. Doumas – D. A. Hardy – J. A. Sakellarakis – P. M. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989*. London (The Thera Foundation): 380–89.

Tzachili 1992 — I. Tzachili. 1992. Μικροαντικείμενα στην ανασκαφή του Ακρωτηρίου. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Είκοσι χρόνια έρευνας (1967–1987). Συμπεράσματα-προβλήματα-προοπτικές. Ημερίδα, συμμετοχή στον εορτασμό των εκατόν πενήντα χρόνων της Αρχαιολογικής Εταιρείας, Αθήναι 19 Δεκεμβρίου 1987.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 116. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 139–46.

Tzachili 1997 — I. Tzachili. 1997. *Υφαντική και υφάντρες στο προϊστορικό Αιγαίο, 2000-1000 π.Χ.* Heraklion (Πανεπιστημιακές Εκδόσεις Κρήτης).

Tzachili 2002–03 — I. Tzachili. 2002–03. The clay cylinders from Akrotiri, Thera. A non-literate alternative way of accounting? *Minos* 37–38: 7–76.

Tzachili 2005 — I. Tzachili. 2005. Excavations on Thera and Therasia in the 19th century: a chronicle. *JMA* 18: 231–57.

Tzachili 2006 — I. Tzachili. 2006. *Οι αρχές της αιγαιακής προϊστορίας. Οι ανασκαφές στη Θήρα και τη Θηρασιά τον 19ο αιώνα*. Athens (Η Καθημερινή).

Tzachili 2007a — I. Tzachili. 2007. Ποικίλα. In C. G. Doumas (ed.), *Ακρωτήρι Θήρας. Δυτική Οικία. Τράπεζες-Λίθινα-Μετάλλινα-Ποικίλα.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 246. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία): 245–82.

Tzachili 2007b — I. Tzachili. 2007. Weaving at Akrotiri, Thera: defining cloth-making activities as social process in a Late Bronze Age Aegean town. In C. Gillis – M.-L. B. Nosch (eds.), *Ancient Textiles. Production, Craft and*

Society. Proceedings of the First International Conference on Ancient Textiles, held at Lund, Sweden, and Copenhagen, Denmark, on March 19–23, 2003. Oxford (Oxbow): 190–96.

Tzachili 2008 — I. Tzachili. 2008. Οι πήλινοι κύλινδροι του Ακρωτηρίου. In C.G. Doumas (ed.), *Ακρωτήρι Θήρας. Τριάντα χρόνια έρευνας 1967–1997, Επιστημονική συνάντηση 19–20 Δεκεμβρίου 1997.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 257. Athens (Η εν Αθήναις Αρχαιολογική Εταιρεία): 51–66.

Tzachili forthcoming — I. Tzachili. (forthcoming). Τα νέα στοιχεία για την υφαντική στο Ακρωτήρι μετά τις πρόσφατες ανασκαφικές έρευνες. In C.G. Doumas (ed.), *Πρακτικά διημερίδας Ακρωτήρι Θήρας: Σαράντα χρόνια έρευνας (1967–2007), Αρχαιολογική Εταιρεία, 15–16 Δεκεμβρίου 2007.*

Tzavella-Evjen 1970 — H. Tzavella-Evjen. 1970. *Τα πτερωτά όντα της προϊστορικής εποχής του Αιγαίου.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 68. Athens (Η Εν Αθήναις Αρχαιολογική Εταιρεία).

Vakirtzi forthcoming — S. Vakirtzi. (forthcoming). 4. Middle Cycladic spindle-whorls and loomweights. 4.2. The loomweights. In I. Nikolakopoulou, *Akrotiri, Thera. Middle Bronze Age. Pottery and Stratigraphy.* Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας.

van Soldt 2000 — W.H. van Soldt. 2000. Private archives at Ugarit. In A.C.V.M. Bongenaar (ed.), *Interdependency of Institutions and Private Entrepreneurs, Proceedings of the Second MOS Symposium (Leiden 1998).* Leiden (Nederlands Historisch-Archaeologisch Instituut te Istanbul): 229–45.

Vanschoonwinkel 1990 — J. Vanschoonwinkel. 1990. Animal representations in Theran and other Aegean arts. In C.G. Doumas – D.A. Hardy – J.A. Sakellarakis – P. Warren (eds.), *Thera and the Aegean World* III,1. *Proceedings of the Third International Congress, Santorini, Greece, 3–9 September 1989.* London (The Thera Foundation): 327–47.

Vlachopoulos 2007 — A.G. Vlachopoulos. 2007. Disiecta membra: the wall paintings from the "Porter's Lodge" at Akrotiri. In P.P. Betancourt – M.C. Nelson – H. Williams (eds.), *Krinoi kai Limenes. Studies in Honor of Joseph and Maria Shaw.* Prehistory Monographs 22. Philadelphia (INSTAP Academic Press): 131–38.

Vlachopoulos 2008 — A.G. Vlachopoulos. 2008. The wall-paintings from the Xeste 3 building at Akrotiri: towards an interpretation of the iconographic programme. In N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon. Ορίζων. A Colloquium on the Prehistory of the Cyclades. McDonald Institute Monographs – Stavros Niarchos Foundation.* Cambridge (McDonald Institute for Archaeological Research): 451–65.

Vlachopoulos 2015 — A.G. Vlachopoulos. 2015. Detecting 'Mycenaean' elements in the 'Minoan' wall paintings of a 'Cycladic' settlement: the wall paintings at Akrotiri, Thera within their iconographic koine. In H. Brecoulaki – J.L. Davis – S.R. Stocker (eds.), *Mycenaean Wall Painting in Context: New Discoveries, Old Finds Reconsidered.* Meletemata 72. Athens

(National Hellenic Research Foundation, Institute of Historical Research): 36–65.

Vlachopoulos – Georma 2012 — A. G. Vlachopoulos – F. Georma. 2012. Jewellery and adornment at Akrotiri, Thera: the evidence from the wall paintings and the finds. In M.-L. Nosch – R. Laffineur (eds.), *Kosmos. Jewellery, Adornment and Textiles in the Aegean Bronze Age. Proceedings of the 13th International Aegean Conference / 13e rencontre égéenne internationale, University of Copenhagen, Danish National Research Foundation's Centre for Textile Research, 21 - 26 April 2010*. Aegaeum 33. Leuven – Liège (Peeters): 35–42.

Vlasaki – Hallager 1995 — M. Vlasaki – E. Hallager. 1995. Evidence for seal use in Pre-Palatial western Crete. In W. Müller (ed.), *Sceaux minoens et mycéniens. IVe symposium international, 10–12 septembre 1992, Clermont-Ferrand. CMS* Beiheft 5. Berlin (Gebrüder Mann): 251–70.

von Pilgrim 1996 — C. von Pilgrim. 1996. *Elephantine XVIII: Untersuchungen in der Stadt des Mittleren Reiches und der zweiten Zwischenzeit*. AV 91. Mainz (Philipp von Zabern).

Voutsaki 1999 — S. Voutsaki. 1999. Mortuary display, prestige and identity in the Shaft Grave era. In *Eliten in der Bronzezeit. Ergebnisse zweier Kolloquien in Mainz und Athen*. Monographien des Römisch-Germanischen Zentralmuseums 43,1. Mainz (Verlag des Römisch-Germanischen Zentralmuseums): 103–17.

Warren 1969 — P. Warren. 1969. *Minoan Stone Vases*. Cambridge Classical Studies. Cambridge (Cambridge University Press).

Warren 1979 — P. Warren. 1979. The stone vessels from the Bronze Age settlement at Akrotiri, Thera. *ArchEph*: 82–113.

Warren 2000 — P. Warren. 2000. Shield and goddess in Minoan Crete and the Aegean. In T. Detorakis – A. Kalokerinos (eds.), *Πεπραγμένα του Η΄ Διεθνούς Κρητολογικού Συνεδρίου/Proceedings of the 8th International Cretological Conference, Herakleion, 9–14 October 1996*, A3. Heraklion (Εταιρία Κρητικών Ιστορικών Μελετών): 457–70.

Warren 2010 — P. Warren. 2010. The absolute chronology of the Aegean circa 2000 B.C.–1400 B.C. A summary. In W. Müller (ed.), *Die Bedeutung der minoischen und mykenischen Glyptik. VI. Internationales Siegel-Symposium aus Anlass des 50 jährigen Bestehens des CMS. Marburg, 9.–12. October 2008. CMS* Beiheft 8. Mainz (Philipp von Zabern): 383–94.

Watrous *et al.* 2015 — L. V. Watrous – D. M. Buell – J. C. McEnroe – J. G. Younger – L. A. Turner – B. S. Kunkel – K. Glowacki – S. Gallimore – A. Smith – P. A. Pantou – A. Chapin – E. Margaritis. 2015. Excavations at Gournia, 2010–2012. *Hesperia* 84: 397–465.

Webb – Frankel 1994 — J. Webb – D. Frankel. 1994. Making an impression: storage and surplus finance in Late Bronze Age Cyprus. *JMA* 7: 5–26.

Wegner 2004 — J. Wegner. 2004. Social and historical implications of sealings of the king's daughter Reniseneb and other women at the town of Wah-Sut. In M. Bietak – E. Czerny (eds.), *Scarabs of the 2nd Millennium B.C.*

from Egypt, Nubia, Crete and the Levant: Chronological and Historical Implications. Papers of a Symposium, Vienna, 10th–13th January 2002. Denkschriften der Gesamtakademie 35. Vienna (Verlag der Österreichischen Akademie der Wissenschaften): 221–40.

Wegner 2007 — J. Wegner. 2007. *The Mortuary Temple of Senwosret III at Abydos.* Publications of the Pennsylvania-Yale Expedition to Egypt 8. New Haven (Peabody Museum of Natural History of Yale University).

Weingarten 1983a — J. Weingarten. 1983. The use of the Zakro sealings. *Kadmos* 22: 8–13.

Weingarten 1983b — J. Weingarten. 1983. *The Zakro Master and his Place in Prehistory.* SIMA-PB 26. Gothenburg (Paul Åströms Förlag).

Weingarten 1986a — J. Weingarten. 1986. Some unusual Minoan clay nodules. *Kadmos* 25: 1–21.

Weingarten 1986b — J. Weingarten. 1986. The sealing structures of Minoan Crete: MM II Phaistos to the destruction of the palace of Knossos. Part I: The evidence until the LM IB destructions. *OJA* 5: 279–98.

Weingarten 1987 — J. Weingarten. 1987. Seal-use at LM IB Ayia Triada: a Minoan elite in action. I. Administrative considerations. *Kadmos* 26: 1–43.

Weingarten 1988 — J. Weingarten. 1988 The sealing structures of Minoan Crete: MM II Phaistos to the destruction of the palace of Knossos. Part II: The evidence from Knossos until the destruction of the palace. *OJA* 7: 1–17.

Weingarten 1989 — J. Weingarten. 1989. Old and new elements in the seals and sealings of the Temple Repository, Knossos. In R. Laffineur (ed.), *Transition. Le monde égéen du Bronze Moyen au Bronze Récent*. Aegaeum 3. Liège (Université de Liège, Histoire de l'art et archéologie de la Grèce antique): 39–52.

Weingarten 1990a — J. Weingarten. 1990. Three upheavals in Minoan sealing administration: evidence for radical change. In T. G. Palaima (ed.), *Aegean Seals, Sealings and Administration. Proceedings of the NEH-Dickson Conference of the Program in Aegean Scripts and Prehistory of the Department of Classics, University of Texas at Austin, January 11–13, 1989.* Aegaeum 5. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 105–20.

Weingarten 1990b — J. Weingarten. 1990. More unusual Minoan clay nodules: Addendum II. *Kadmos* 29: 16–23.

Weingarten 1990c — J. Weingarten. 1990. The sealing structure of Karahöyük and some administrative links with Phaistos on Crete (with an appendix on the sealings from Uronarti Fort). *OA* 29: 63–95.

Weingarten 1991 — J. Weingarten. 1991. Late Bronze Age trade within Crete: the evidence of seals and sealings. In N. H. Gale (ed.), *Bronze Age Trade in the Mediterranean.* SIMA 90. Jonsered (Paul Åströms Förlag): 303–24.

Weingarten 1992 — J. Weingarten. 1992. The multiple sealing system of Minoan Crete and its possible antecedents in Anatolia. *OJA* 11: 25–37.

Weingarten 1994a — J. Weingarten. 1994. Sealings and sealed documents at Bronze Age Knossos. In D. Evely – H. Hughes-Brock – N. Momigliano (eds.),

Knossos, a Labyrinth of History. Papers presented in Honour of Sinclair Hood. London (British School at Athens): 171–88.

Weingarten 1994b — J. Weingarten. 1994. Two sealings studies in the Middle Bronze Age. I: Karahöyük, II: Phaistos. In P. Ferioli – E. Fiandra – G.G. Fissore – M. Frangipane (eds.), *Archives Before Writing. Proceedings of the International Colloquium, Oriolo Romano, October 23–25, 1991*. Pubblicazioni del Centro Internazionale di Ricerche Archeologiche, Antropologiche e Storiche 1. Rome – Torino (Scriptorium): 262–95.

Weingarten 2000 — J. Weingarten. 2000. Some stamped weights from eastern Crete. In T. Detorakis – A. Kalokerinos (eds.), *Πεπραγμένα του Η΄ Διεθνούς Κρητολογικού Συνεδρίου/Proceedings of the 8th International Cretological Conference, Herakleion, 9–14 October 1996*, A3. Heraklion (Εταιρία Κρητικών Ιστορικών Μελετών): 485–95.

Weingarten 2009 — J. Weingarten. 2009. The Zakro Master and questions of gender. In K. Kopaka (ed.), *Fylo. Engendering Prehistoric 'Stratigraphies' in the Aegean and the Mediterranean, Proceedings of an International Conference, University of Crete, Rethymno, 2–5 June 2005.* Aegaeum 30. Leuven – Liège (Université de Liège, Histoire de l'art et archéologie de la Grèce antique): 139–49.

Weingarten 2010a — J. Weingarten. 2010. Corridors of power: a Social Network Analysis of the Minoan 'replica rings'. In W. Müller (ed.), *Die Bedeutung der minoischen und mykenischen Glyptik. VI. Internationales Siegel-Symposium aus Anlass des 50 jährigen Bestehens des CMS. Marburg, 9.–12. October 2008. CMS* Beiheft 8. Mainz (Philipp von Zabern): 395–412.

Weingarten 2010b — J. Weingarten. 2010. Minoan seals and sealings. In E.H. Cline (ed.), *The Oxford Handbook of the Bronze Age Aegean (ca. 3000–1000 BC).* Oxford (Oxford University Press): 317–28.

Weingarten 2015 — J. Weingarten. 2015. Old, worn and obscured: stamped pot handles at Pyrgos. In C. Macdonald – E. Hatzaki – S. Andreou (eds.), *The Great Islands: Studies of Greece and Cyprus presented to Gerald Cadogan*. Athens (Kapon): 71–75.

Whitelaw 2005 — T. Whitelaw. 2005. A tale of three cities: chronology and minoanisation at Phylakopi in Melos. In A. Dakouri-Hild – S. Sherratt (eds.), *Autochthon. Papers presented to O.T.P.K. Dickinson on the Occasion of his Retirement, Institute of Classical Studies, University of London, 9 November 2005*. BAR-IS 1432. Oxford (Archaeopress): 37–69.

Wiener 2012 — M.H. Wiener. 2012. Problems in the measurement, calibration, analysis, and communication of radiocarbon dates (with special reference to the prehistory of the Aegean world). *Radiocarbon* 54: 423–34.

Wiener 2013 — M. H. Wiener. 2013. Realities of power: the Minoan thalassocracy in historical perspective. In R. B. Koehl (ed.), *Amilla. The Quest for Excellence. Studies presented to Guenter Kopcke in Celebration of his 75th Birthday*. Philadelphia (INSTAP Academic Press): 149–73.

Williams 1908 — B.E. Williams. 1908. Appendix B. Seal stones from Gournia. In H. Boyd Hawes – B.E. Williams – R. B. Seager – E.H. Hall (eds.), *Gournia.*

Vasiliki and Other Prehistoric Sites on the Isthmus of Hierapetra, Crete. Excavations of the Wells-Houston-Cramp Expeditions, 1901, 1903, 1904. Philadelphia (American Exploration Society, Free Museum of Science and Art): 54–55.

Woods 2010 — C. Woods. 2010. The earliest Mesopotamian writing. In C. Woods – G. Emberling – E. Teeter (eds.), *Visible Language: Inventions of Writing in the Ancient Middle East and Beyond.* Oriental Institute Museum Publications 32. Chicago (The Oriental Institute of the University of Chicago): 33–50.

Wright 2006 — J. C. Wright. 2006. The formation of the Mycenaean palace. In S. Deger-Jalkotzy – I. S. Lemos (eds.), *Ancient Greece: From the Mycenaean Palaces to the Age of Homer.* Edinburgh Leventis Studies 3. Edinburgh (Edinburgh University Press): 7–51.

Younger 1973 — J. G. Younger. 1973. Towards the chronology of Aegean glyptic in the Late Bronze Age. Unpublished PhD thesis (University of Cincinnati).

Younger 1976 — J. G. Younger. 1976. Bronze Age representations of Aegean bull-leaping. *AJA* 80: 125–37.

Younger 1977 — J. G. Younger. 1977. Non-sphragistic uses of Minoan-Mycenaean sealstones and rings. *Kadmos* 16: 141–59.

Younger 1983 — J. G. Younger. 1983. Aegean seals of the Late Bronze Age: masters and workshops. II. The first-generation Minoan masters. *Kadmos* 22: 109–36.

Younger 1988 — J. G. Younger. 1988. *The Iconography of Late Minoan and Mycenaean Sealstones and Finger Rings*. Bristol (Bristol Classical Press).

Younger 1991 — J. G. Younger. 1991. Seals? from Middle Helladic Greece. *Hydra* 8: 35–54.

Younger 1995 — J. G. Younger. 1995. Bronze Age representations of Aegean bull-games III. In R. Laffineur – W.-D. Niemeier (eds.), *Politeia. Society and State in the Aegean Bronze Age. Proceedings of the 5th International Aegean Conference/5e rencontre égéenne internationale, University of Heidelberg, Archäologisches Institut, 10–13 April 1994.* Aegaeum 12. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 507–45.

Younger 1997 — J. G. Younger. 1997. The stelai of Mycenae Grave Circles A and B. In R. Laffineur – P. P. Betancourt (eds.), *Techne. Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age/Artisanat et artisans en Égée à l'Âge du Bronze. Proceedings of the 6th International Aegean Conference/6e rencontre égéenne internationale, Philadelphia, Temple University, 18–21 April 1996*. Aegaeum 16. Liège – Austin (Université de Liège, Histoire de l'art et archéologie de la Grèce antique/University of Texas at Austin Program in Aegean Scripts and Prehistory): 229–39.

Younger 2007 — J. G. Younger. 2007. Appendix J: Two sealstones from Early Cycladic contexts. In C. Renfrew – N. Brodie – C. Morris – C. Sarre (eds.), *Excavations at Phylakopi in Melos 1974–77. BSA* Supplementary Volume 42. London (British School at Athens): 455.

Younger – Betts 1979 J. G. Younger – J. H. Betts. 1979. Eight sealstones and a sealing from the Stratigraphical Museum at Knossos. *BSA* 74: 271–78.

Yule 1981 P. Yule. 1981. *Early Cretan Seals. A Study of Chronology.* Marburger Studien zur Vor- und Frühgeschichte 4. Mainz (Philipp von Zabern).

Specific References to Other Online Resources

Arshama Letters, Letters Pell. Aram. no. IX
https://arshama.bodleian.ox.ac.uk/letters/ (accessed on 9/10/2017)

Calames, Nancy. BU Droit, Manuscrits d'Émile Burnouf no. 45
http://www.calames.abes.fr/pub/#details?id=FileId-1062 (accessed on 9/10/2017)

CMS Seal Database, *CMS* V no. 690
http://arachne.uni-koeln.de/item/objekt/163872 (accessed on 9/10/2017)

Khalili Collections, Aramaic Documents
http://www.khalilicollections.org/all-collections/aramaic-documents/ (accessed on 9/10/2017)

Khalili Collections, Aramaic Documents no. IA20
http://www.khalilicollections.org/collections/aramaic-documents/khalili-collection-aramaic-documents-sealed-document-announcing-the-dispatch-of-sheep-ia20/ (accessed on 9/10/2017)

ABSTRACT

SEALS, SEALINGS AND SEAL IMPRESSIONS FROM AKROTIRI IN THERA

This monograph contains the primary publication of the seals (**S1**–**S16**), sealings (**N1**–**N75**) and stamped objects (**I1**–**I3**) retrieved at the Bronze Age site of Akrotiri in Thera. Their contexts date from the MC A period, which corresponds roughly to the Cretan MM I period (at the turn of the third to the second millennium BC), until the final volcanic destruction phase that occurred at a mature phase of LC/LM IA (1623/1530 BC). The majority of the objects examined had been manufactured in Crete and were imported to Akrotiri as ready-made items.

The monograph first examines the archaeological contexts where the objects were found, and then considers the objects from a typological and iconographical viewpoint. The place and possible role of these objects at Akrotiri are also discussed. Seals appear to have remained an alien body in Akrotiri until the end, as they were a distinctly Cretan product that was seemingly assimilated but not emulated. The notable paucity of objects with seal impressions (other than the nodules) further reinforces the absence of any meaningful, practical role for seals in the social practices at Akrotiri. It also suggests that the reason for the acquisition of seals at Akrotiri was the very Cretan provenance of these objects, as opposed to any other practical need.

Sealings were evidently meaningful to certain individuals at Akrotiri, who were definitely acquainted with and somehow involved in Minoan Neopalatial administrative practices. Their study has helped elucidate certain aspects of Minoan Neopalatial administration. Important, among other observations, are the 'collaborative' stamping patterns between administrators who were clearly part of a strict, hierarchical administrative chain, observed in the so-called flat-based nodules. The seal impressions and their combinations on these sealings reveal seal bearers of higher and lower ranks, as well as their respective responsibilities in the administrative praxis. The comparative study of material from LM IB sites in Crete exposes patterns that were largely similar to the ones observed at Akrotiri, still practised some 80–120 years after Akrotiri had perished in the volcanic eruption.

ΣΦΡΑΓΙΔΕΣ, ΣΦΡΑΓΙΣΜΑΤΑ ΚΑΙ ΑΠΟΤΥΠΩΜΑΤΑ ΣΦΡΑΓΙΔΩΝ ΑΠΟ ΤΟ ΑΚΡΩΤΗΡΙ ΘΗΡΑΣ

Η μονογραφία αυτή αποτελεί την πρωτογενή δημοσίευση των σφραγίδων (**S1**–**S16**), σφραγισμάτων (**N1**–**N75**) και ενσφράγιστων αντικειμένων (**I1**–**I3**) από τον οικισμό της Εποχής του Χαλκού στο Ακρωτήρι Θήρας. Η παρουσία τους στον οικισμό πιστοποιείται από τη Μεσοκυκλαδική Α περίοδο, που συμπίπτει κατά προσέγγιση με τη Μεσομινωική Ι περίοδο της Κρήτης (στη μετάβαση από την τρίτη προς τη δεύτερη χιλιετία π.Χ.), ως και την Υστεροκυκλαδική/Υστερομινωική ΙΑ περίοδο (1623/1530 π.Χ.) κατά την οποία επήλθε η τελική ηφαιστειακή καταστροφή. Η πλειονότητα των υπό εξέταση αντικειμένων είχε κατασκευαστεί στην Κρήτη και είχε εισαχθεί στο Ακρωτήρι ως έτοιμα προϊόντα.

Σε πρώτο επίπεδο εξετάζονται τα αρχαιολογικά συγκείμενα των ευρημάτων και στη συνέχεια τα ίδια τα αντικείμενα από τυπολογική και εικονογραφική άποψη. Σε δεύτερο επίπεδο εξετάζεται η θέση και ο πιθανός τους ρόλος στο Ακρωτήρι. Οι σφραγίδες φαίνεται πως παρέμειναν ως το τέλος ξένο σώμα στον οικισμό, εφόσον συνιστούσαν ένα διακριτό κρητικό προϊόν το οποίο, αν και είχε ενταχθεί, κατά τα φαινόμενα, στο κοινωνικό γίγνεσθαι, δεν είχε ωστόσο αφομοιωθεί. Η εντυπωσιακή σπανιότητα ενσφράγιστων αντικειμένων (πέραν των σφραγισμάτων) τονίζει ακόμα περισσότερο την απουσία ενός άμεσα κατανοητού σε μας ρόλου για τις σφραγίδες στην κοινωνία του Ακρωτηρίου. Αυτό το γεγονός παραπέμπει στην ίδια τη μινωική προέλευση αυτών των αντικειμένων ως τον λόγο εισαγωγής σφραγίδων στο Ακρωτήρι και όχι σε κάποια πρακτικού τύπου αναγκαιότητα.

Τα σφραγίσματα, τέλος, στο Ακρωτήρι είχαν σημασία και απευθύνονταν σε άτομα τα οποία ήταν οπωσδήποτε εξοικειωμένα και εμπλέκονταν κατά κάποιο τρόπο στις μινωικές, διοικητικές πρακτικές της Νεοανακτορικής περιόδου. Η μελέτη τους κατάφερε να διαφωτίσει ορισμένες πτυχές της μινωικής, νεοανακτορικής διοίκησης. Μία σημαντική, μεταξύ άλλων, παρατήρηση είναι οι «συνεργατικές» σφραγιστικές δράσεις διοικητικών υπαλλήλων που παρατηρήθηκαν στα λεγόμενα σφραγίσματα με επίπεδη βάση. Αυτοί οι τελευταίοι ήταν αναμφίβολα κρίκοι μίας αυστηρής ιεραρχικής διοικητικής αλυσίδας. Τα αποτυπώματα των σφραγίδων και οι συνδυασμοί τους πάνω στα σφραγίσματα μαρτυρούν την ύπαρξη σφραγιδοφόρων υπαλλήλων ανώτερου και κατώτερου βαθμού με αντίστοιχες υπευθυνότητες στο πλαίσιο των διοικητικών πρακτικών. Η σύγκριση με υλικό από θέσεις της Υστερομινωικής ΙΒ περιόδου στην Κρήτη αποκαλύπτει ενεργές διοικητικές δομές, σε μεγάλο βαθμό ανάλογες με αυτές που μαρτυρούνται στο Ακρωτήρι, σε μία περίοδο που απέχει 80–120 χρόνια από την ολοκληρωτική εξαφάνιση του αρχαίου οικισμού λόγω της ηφαιστειακής έκρηξης.

SIEGEL, TONPLOMBEN UND SIEGELABDRÜCKE AUS AKROTIRI AUF THERA

Diese Monographie stellt die Publikation der Siegel (**S1**–**S16**), Siegelabdrücke (**N1**–**N75**) und gesiegelten Objekte (**I1**–**I3**) dar, die in der bronzezeitlichen Stätte von Akrotiri auf Thera zutage gekommen sind. Ihre Kontextdatierungen reichen von der Phase Mittelkykladisch A, die ungefähr der Phase Mittelminoisch I entspricht (um die Jahrhundertwende vom dritten zum zweiten Jahrtausend v. Chr.), bis in die endgültige vulkanische Zerstörungsphase, die in die fortgeschrittene Periode Spätkykladisch/Spätminoisch IA (1623/1530 v. Chr.) datiert. Die Mehrheit der untersuchten Objekte war auf Kreta hergestellt und als fertige Stücke nach Akrotiri importiert worden.

Die Monographie betrachtet zunächst die archäologischen Kontexte, innerhalb derer die Objekte aufgefunden wurden und untersucht sie unter typologischen und ikonographischen Gesichtspunkten. Die Stellung und mögliche Rollen der Fundstücke in Akrotiri werden ebenfalls besprochen. Es scheint, dass Siegel in Akrotiri bis zum Ende Fremdkörper geblieben sind, da sie ein dezidiert kretisches Erzeugnis darstellten, das scheinbar assimiliert, jedoch nicht nachgeahmt wurde. Der Mangel an gestempelten Objekten (mit Ausnahme von Tonplomben) verstärkt den Eindruck, dass den Siegeln keinerlei offenkundig bedeutungstragende Rolle innerhalb der sozialen Praktiken von Akrotiri zukam. Dies deutet darauf hin, dass der Grund für die Aneignung von Siegeln in Akrotiri eben die kretische Herkunft der Objekte war und kein praktisches Bedürfnis an sich.

Siegelabdrücke waren offensichtlich bedeutsam für bestimmte Individuen in Akrotiri, denen neupalastzeitliche minoische Verwaltungspraktiken bekannt waren und die auf irgendeine Art in diese verwickelt waren. Ihre Untersuchung hat dazu beigetragen, bestimmte Aspekte der neupalastzeitlichen minoischen Administration zu ergründen. Einen bedeutenden Einblick bieten u.a. die „kollaborativen" Stempelmuster zwischen Beamten, die eindeutig Glieder einer strengen administrativen Kette bildeten, wie in den sogenannten Päckchenplomben beobachtet werden konnte. Die Siegelabdrücke und ihre Kombinationen auf den Tonplomben offenbaren Siegelträger höheren und niedrigeren Rangs und deren jeweilige Verantwortlichkeit innerhalb der administrativen Praktiken. Die Vergleichsstudie von Material aus SM IB Stätten auf Kreta legt Muster offen, die sich weithin gleichen und noch einige 80–120 Jahre nach dem Untergang von Akrotiri durch den Vulkanausbruch praktiziert wurden.

LIST OF FIGURES

Fig. 102. Twenty-six flat-based nodules from the deposit in Katré Street, Chania, with a single impression each executed by the same seal (ChM 1501–1526 = *CMS* V Suppl. 1A no. 175; Archaeological Museum of Chania © Ministry of Culture and Sports/Archaeological Receipts Fund, photo by A. Karnava).

Fig. 103. Nodules from Gournia: HMs 101 (top), impressions from the same ring (now *CMS* II,6 nos. 43/161/259/II,7 no. 39) on sealings at Agia Triada, Sklavokambos, Zakros and Gournia; HMs 102 (bottom), impressions from the same ring (now *CMS* II,6 nos. 44/162/255) on sealings at Agia Triada, Sklavokambos and Gournia (Betts 1967, 29, fig. 1).

Fig. 104. Seal impressions *CMS* II7, nos. 117, 119 and 151, all attested together on fourteen flat-based nodules from Zakros (HMs 10/1, 3–6, 9–15, 17, OAM AE 1199m); and seal impressions *CMS* II7, nos. 118, 120 and 152 attested together on three flat-based nodules from Zakros (HMs 10/7, 16, OAM AE 1199w) (*CMS* Archive).

Fig. 105. Seal impressions from Kato Zakros, House A: *CMS* II7, nos. 16 and 37 attested on eleven flat-based nodules (HMs 17/1, 4, 5, 12, 17/29, 18–20, 27, 31, 33); *CMS* II,7 nos. 16 and 38 attested on flat-based nodule HMs 17/15; *CMS* II,7 nos. 16 or 17 and 37 attested on flat-based nodule HMs 37/1; *CMS* II,7 nos. 17 and 38 attested on 18 flat-based nodules (HMs 17/2, 3, 8–11, 13, 14, 16, 17, 21, 22, 24–26, OAM AE 1199p, 1199z, without inv. no.), but also on three two-hole hanging nodules (HMs 17/6, 7, 34) (*CMS* Archive).

Fig. 106. Impressions of four different rings, the multiple attestations of which were found in different sites in Crete and, now, Akrotiri (after Krzyszkowska 2005a, 190 nos. 368–371; image courtesy of O. Krzyszkowska).

Fig. 107. Clay Pastes A–C attested in the Akrotiri nodules (Akrotiri Excavations Archives/*CMS* Archive, photos by A. Karnava).

Fig. 108. The nine seals that had participated in six different pairs to stamp the majority of the Akrotiri flat-based nodules (*CMS* V Suppl. 3 no. 392 in two different pairs; V Suppl. 3 no. 393 in two different pairs; V Suppl. 3 nos. 394, 404, 395, 396 in two different pairs; V Suppl. 3 nos. 397, 398, 399); scale: 3:2 (*CMS* Archive).

Fig. 109. Two different ways of flat-based nodule preparation: **N18**, seals stamped perpendicularly to the wrapped string; **N48**, seals stamped parallel to the wrapped string. Depicted are the tops of the nodules (top) and the the casts of the folded leather underneath the nodules (bottom); scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive, photos by A. Karnava).

Fig. 110. Complete flat-based nodules of two different sizes: large-sized **N18**, **N24**; small-sized **N48**, **N50**; scale: 3:2 (Akrotiri Excavations Archives/*CMS* Archive, photos by A. Karnava).

Fig. 111. Two groups of flat-based nodules and their respective seal impressions: 'Group 1' (*CMS* V Suppl. 3 no. 392 used single-handedly and in two different pairs; V Suppl. 3 no. 393 used in two different pairs; V Suppl. 3 nos. 394, 404); 'Group 2' (V Suppl. 3 nos. 395, 396 used in two different pairs; V Suppl. 3 nos. 397, 398, 399, 403, 405); scale: 1:1 (*CMS* Archive).

Fig. 112. Agia Triada pairs of administrators: 'first rank' administrators *CMS* II,6 nos. 15, 19, 82 and 89 stamped together with 'second rank' administrators II, 6 nos. 4, 41, 121 and 55 respectively); scale: 1:1 (*CMS* Archive).

Fig. 113. Zakros pairs of administrators: 'first rank' administrators *CMS* II,7 nos. 7, 15, 70 and 110 stamped together with 'second rank' administrators II,7 nos. 11, 64, 244 and 116 respectively; 'first rank' *CMS* II,7 no. 33 stamped together with two 'second rank' administrators II,7 nos. 41 and 51; 'first rank' *CMS* II,7 no. 99 stamped together with three 'second rank' administrators II,7 nos. 11, 31 and 81. Since 'second rank' administrators *CMS* II,7 nos. 31 and 81 stamped also with II,7 no. 215, we assume that II,7 no. 215 is also a 'first rank' administrator, although no single-handed impressions of this seal are found; scale: 1:1 (*CMS* Archive).Fig. 114. A 'first rank'/'dominant' administrator *CMS* V Suppl. 3 no. 392,

CONCORDANCES

AKROTIRI EXCAVATIONS CATALOGUE	*CMS* BEIHEFT 10
A0920	**S9**
A2838	**S12**
A3009	**S6**
A3305	**S7**
A3588	**S13**
A3752	**S11**
A4212	**S5**
A4385	**I1**
A6383	**S14**
A8385	**S15**
A8534	**I2**
A8888	**N1**
A8889	**N2**
A8890	**N3**
A8891	**N11**
A8892 + A11694 + A11696	**N12**
A8893 + A11691	**N13**
A8894	**N14**
A8895 + A11681	**N15**
A8896	**N16**
A8897	**N17**
A8898	**N18**
A8899	**N19**
A8900	**N20**
A8901	**N21**
A8902	**N22**
A8903	**N23**
A8904 + A11688	**N24**
A8905	**N25**
A8906 + A11678	**N26**
A8907	**N27**
A8908	**N28**
A8909	**N29**
A8910	**N30**
A8911	**N31**
A8912	**N32**
A8913 + A11690	**N33**
A8914	**N34**
A8915 + A11683	**N4**
A8916	**N35**
A8917 + A11693	**N44**
A8918	**N43**
A8919	**N5**
A8920	**N6**
A8921	**N71**
A8922	**N40**

AKROTIRI EXCAVATIONS CATALOGUE	*CMS* BEIHEFT 10
A8923	**N7**
A8924	**N8**
A8925	**N72**
A8926	**N38**
A8927	**N39**
A8928	**N45**
A8929	**N46**
A8930	**N47**
A8931	**N48**
A8932	**N49**
A8933	**N50**
A8934	**N51**
A8935	**N52**
A8936	**N53**
A8937	**N55**
A8938	**N56**
A8939	**N54**
A8940	**N58**
A8941	**N9**
A8942	**N69**
A8943	**N74**
A8944	**N59**
A8945	**N42**
A8946	**N60**
A9022	**S2**
L1835	**S10**
L1836	**S8**
L3134	**S4**
L3136	**S1**
L3139	**S3**
A10990	**I3**
A11679	**N10**
A11680	**N36**
A11682	**N41**
A11684	**N63**
A11685	**N64**
A11686	**N65**
A11687	**N37**
A11689	**N73**
A11692	**N66**
A11695	**N70**
A11697	**N61**
A11698	**N67**
A11699	**N68**
A11700	**N62**
A11701	**N75**
A11796	**N57**
–	**S16**

DOUMAS 2000b	*CMS* BEIHEFT 10
no. 1	**N1**
no. 2	**N2**
no. 3	**N3**
no. 4	**N11**
nos. 5 + 86 + 89	**N12**
nos. 6 + 87 + 82	**N13**
no. 7	**N14**
nos. 8 + 71	**N15**
no. 9	**N16**
no. 10	**N17**
nos. 11 + 27	**N18**
nos. 12 + 24	**N19**
no. 13	**N20**
no. 14	**N21**
no. 15	**N22**
nos. 16 + 29	**N23**
nos. 17 + 21 + 79	**N24**
no. 18	**N25**
nos. 19 + 67	**N26**
no. 20	**N27**
no. 22	**N28**
no. 23	**N29**
no. 25	**N30**
no. 26	**N31**
no. 28	**N32**
nos. 30 + 81	**N33**
no. 31	**N34**
nos. 32 + 68 + 73	**N4**
nos. 33 + 44	**N35**
nos. 34 + 85	**N44**
nos. 35 + 75	**N43**
no. 36	**N5**
nos. 37 + 40	**N6**
no. 38	**N71**
no. 39	**N40**
no. 41	**N7**
no. 42	**N8**
no. 43	**N72**
nos. 45 + 47	**N38**
no. 46	**N39**
no. 48	**N45**
no. 49	**N46**
no. 50	**N47**
no. 51	**N48**
no. 52	**N49**
no. 53	**N50**
no. 54	**N51**

DOUMAS 2000b	*CMS* BEIHEFT 10
no. 55	**N52**
no. 56	**N53**
no. 57	**N55**
no. 58	**N56**
no. 59	**N54**
nos. 60 + 84	**N58**
no. 61	**N9**
no. 62	**N69**
no. 63	**N74**
no. 64	**N59**
no. 65	**N42**
no. 66	**N60**
no. 69	**N10**
no. 70	**N36**
no. 72	**N41**
no. 74	**N63**
no. 76	**N64**
no. 77	**N65**
no. 78	**N37**
no. 80	**N73**
no. 83	**N66**
no. 88	**N70**
no. 90	**N61**
no. 91	**N67**
no. 92	**N68**
no. 93	**N62**
–	**I1**
–	**I2**
–	**I3**
–	**N57**
–	**N75**
–	**S1**
–	**S2**
–	**S3**
–	**S4**
–	**S5**
–	**S6**
–	**S7**
–	**S8**
–	**S9**
–	**S10**
–	**S11**
–	**S12**
–	**S13**
–	**S14**
–	**S15**
–	**S16**

CMS	*CMS* BEIHEFT 10
V no. 690	**S12**
V Suppl. 1B no. 361	**S13**
V Suppl. 1B no. 362	**S7**
V Suppl. 1B no. 363	**S5**
V Suppl. 1B no. 364	**S11**
V Suppl. 1B no. 365	**S9**
V Suppl. 3 no. 386	**S3**
V Suppl. 3 no. 387	**S15**
V Suppl. 3 no. 388	**S2**
V Suppl. 3 no. 389	**S1**
V Suppl. 3 no. 390	**S4**
V Suppl. 3 no. 391	**N1–N3**
V Suppl. 3 no. 392	**N4–N8**, **N11–N38**, **N40**, **N41**, **N43** (?), **N64**, **N66**, **N71**, **N72**
V Suppl. 3 no. 393	**N11–N37**, **N42–N44**, **N63**, **N73**
V Suppl. 3 no. 394	**N38**, **N39**
V Suppl. 3 no. 395	**N45–N53**
V Suppl. 3 no. 396	**N45–N52**, **N54–N57**, **N65**
V Suppl. 3 no. 397	**N54**
V Suppl. 3 no. 398	**N58**
V Suppl. 3 no. 399	**N58**
V Suppl. 3 no. 400	**N9**
V Suppl. 3 no. 401	**N69**
V Suppl. 3 no. 402	**N74**
V Suppl. 3 no. 403	**N59**
V Suppl. 3 no. 404	**N42**
V Suppl. 3 no. 405	**N60**

FINDSPOTS	AKROTIRI SEALS, SEALINGS, IMPRESSED OBJECTS
Cenotaph Square, area of PP 17	**S8**
Complex Alpha, Western Quarters Room 3 (NPP 74)	**S1**, **S2**
Delta-East, Room D18a	**N74**
Delta-East, Room D18b	**N1–N73**
Delta-North, Room 4 (upper level [?])	**I1**
Delta-North, Room 4–5, staircase	**S9**
Delta-South, Room D16	**S12**
Delta-West, Room D1a	**S10**
Delta-West, Room D9.1	**S11**
NPP 26NE	**S3**
NPP 62	**I3**
NPP 64	**N75**
NPP 64A	**I2**
NPP 67	**S4**
Building Iota Beta (IB), NPP 44A	**S15**
Square of the Benches	**S13**
Triangle Square	**S6**, **S7**
unexcavated building to the E of the House of the Ladies	**S16**
West House, Room 5	**S5**
Xeste 3, Rooms 13–14	**S14**

MATERIALS	AKROTIRI SEALS
calcareous material	**S15**
clay	**S13**
jasper	**S1**, **S12**
quartz	**S4**
serpentine	**S9**, **S11**
'serpentine'	**S16**
soft stone	**S2**, **S6**
steatite	**S3**, **S5**, **S14**
tuff	**S7**
tuff (?)	**S8**
volcanic stone	**S10**

SHAPES	AKROTIRI SEALINGS
direct	**N74**
flat-based	**N63**
flat-based, one-seal	**N1–N3**, **N5–N7**, **N9**, **N10**
flat-based, one-seal (?)	**N4**, **N8**
flat-based, two-seal	**N11–N43**, **N45–N56**, **N58**, **N60**, **N62**, **N66–N68**
flat-based, two-seal (?)	**N44**, **N59**, **N61**, **N64**, **N65**
flat-based (?), two-seal	**N57**
hanging, one-hole	**N69**
hanging, two-hole	**N70**
nodulus	**N75**
unspecified kind	**N71–N73**

INDEX

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Z