

**AEGAEUM 37**

**Annales liégeoises et PASPiennes d'archéologie égéenne**

# **PHYSIS**

## **L'ENVIRONNEMENT NATUREL ET LA RELATION HOMME-MILIEU DANS LE MONDE ÉGÉEN PROTOHISTORIQUE**

**Actes de la 14<sup>e</sup> Rencontre égéenne internationale,  
Paris, Institut National d'Histoire de l'Art (INHA),  
11-14 décembre 2012**

Édités par Gilles TOUCHAIS,  
Robert LAFFINEUR  
et Françoise ROUGEMONT

PEETERS  
LEUVEN - LIEGE  
2014

## SOMMAIRE

Préface	11
<b>A. Cadre naturel :</b>	
Georgia KOURTESSI-PHILIPPAKIS, <i>Local vs exogène ? L'impact du milieu naturel sur la composition des assemblages lithiques néolithiques en Grèce</i>	15
Georgia STRATOULI, Anaya SARPAKI, Maria NTINOI, Eleni KOTJABOPOULOU, Tatiana THEODOROPOULOU, Vasilios MELFOS, Niels H. ANDREASEN, Panagiotis KARKANAS, <i>Dialogues Between Bioarchaeological, Geoarchaeological and Archaeological Data: Approaches to Understanding the Neolithic Use of Drakaina Cave, Kefhalonia Island, Western Greece</i>	23
Erika WEIBERG, <i>Timing, Perception and Response. Human Dimensions of Erosion and Sedimentation in the Greek Bronze Age</i>	33
Evangelia STEFANI, Nikos MEROUSIS, <i>Living on the Edge. People and Physis in Prehistoric Imathia, Macedonia, Greece</i>	41
Mimoza SIDIROPOULOU, Eric FOUACHE, Kosmas PAVLOPOULOS, Maria TRIANTAPHYLLOU, Konstantinos VOVALIDIS, George SYRIDES, Emanuele GRECO, <i>Geomorphological Evolution and Paleoenvironment Reconstruction in the Northeastern Part of Lemnos Island (North Aegean Sea)</i>	49
Thomas F. STRASSER, Anne P. CHAPIN, <i>Geological Formations in the Flotilla Fresco from Akrotiri</i>	57
<b>B. Ressources naturelles :</b>	
Katerina ATHANASAKI, <i>A Serpentine Quarry-Scape in Gonies, North-Central Crete</i>	67
Gerald CADOGAN, <i>Water Worries and Water Works in Bronze Age Southern Crete</i>	73
Jonathan M. FLOOD, Jeffrey S. SOLES, <i>Water Management in Neopalatial Crete and the Development of the Mediterranean Dry-Season</i>	79
Nagia SGOURITSA, Eleni SALAVOURA, <i>The Exploitation of Inland Natural Resources on an Island Environment: The Case of the Mycenaean Settlement at Lazarides and the South/Southeast Aegina</i>	85
Thomas G. PALAIMA, <i>Harnessing Physis: The Ideology of Control and Exploitation of the Natural World as Reflected in Terminology in the Linear B Texts Derived from Indo-European *bheh<sub>2</sub>u- 'Grow, Arise, Be' and *h<sub>2</sub>eg-ro- "The Uncultivated Wild Field' and Other Roots Related to the Natural Environs</i>	93

**C. Paysage et climat :**

- Miriam G. CLINTON, Sarah C. MURRAY, Thomas F. TARTARON,  
*Gis in Action: Analyzing an Early Bronze Age Coastal Landscape on the Saronic Gulf* 103
- Peter PAVÚK, Magda PIENIAŻEK, Simone RIEHL,  
*Troy and the Troad in the Second Millennium: Changing Patterns in Landscape Use* 111
- Fritz BLAKOLMER,  
*Meaningful Landscapes: Minoan “Landscape Rooms” and Peak Sanctuaries* 121
- Vincenzo AMATO, Fausto LONGO, Maria BREDAKI, Amedeo ROSSI,  
Matthieu GHILARDI, David PSOMIADIS, Maxime COLLEU, Laetitia SINIBALDI,  
Doriane DELANGHE-SABATIER, François DEMORY, Christophe PETIT,  
*Geoarchaeological and Palaeoenvironmental Researches in the Area of Ancient Phaistos  
(Crete, Greece): Preliminary Results* 129
- Christos DOUMAS,  
*Le paysage côtier de la région d’Akrotiri, Théra, avant l’éruption volcanique  
du Bronze récent* 141
- Anne P. CHAPIN, Brent DAVIS, Louise A. HITCHCOCK, Emilia BANOU,  
*The Vapheio Tholos Tomb and the Construction of a Symbolic Landscape in Laconia,  
Greece* 145
- Athanasia KRAHTOPOULOU, Rena VEROPOULIDOU,  
*Linking Inland and Coastal Records: Landscape and Human Histories in Pieria,  
Macedonia, Greece* 153
- Assaf YASUR-LANDAU, Nurith GOSHEN,  
*The Reformed Mountains: Political and Religious Landscapes in the Aegean  
and the Levant* 159
- Georgios FERENTINOS, Maria GKIONI, Maria GERAGA, Georgios PAPTAEODOROU,  
*Neanderthal and Anatomically Modern Human Seafarers in the Aegean Archipelago,  
Mediterranean Sea* 165

**D. Iconographie :**

- Fragoula GEORMA, Artemis KARNAVA, Irene NIKOLAKOPOULOU,  
*The Natural World and its Representations: A View from Akrotiri, Thera* 175
- Andreas VLACHOPOULOS, Lefteris ZORZOS,  
*Physis and Techne on Thera: Reconstructing Bronze Age Environment and Land-Use  
Based on New Evidence from Phytoliths and the Akrotiri Wall-Paintings* 183
- Elsa PAPATSAROUCHEA,  
*Minoan Landscapes: Plant Communities and their Artistic Representations* 199
- John G. YOUNGER,  
*The “World of People”: Nature and Narrative in Minoan Art* 211
- Karen Polinger FOSTER,  
*Fur and Feathers in Aegean Art* 217

**E. Agriculture :**

- Georgia KOTZAMANI, Alexandra LIVARDA,  
*Plant Resource Availability and Management in Palaeolithic and Mesolithic Greece* 229

Harriet BLITZER, <i>Preliminary Notes on Olive Domestication and Cultivation in the Prehistoric Aegean</i>	239
Orestes DECAVALLAS, <i>Plant Oils from Neolithic Aegean Pottery: Chemical Proof of the Exploitation of Oleaginous Plants and the Question of "Early" Oil Production</i>	245
Leonidas VOKOTOPOULOS, Gerhard PLATH, Floyd W. McCOY, <i>The Yield of the Land: Soil Conservation and the Exploitation of Arable Land at Choiromandres, Zakros in the New Palace Period</i>	251
Robert Angus K. SMITH, Mary K. DABNEY, Georgia KOTZAMANI, Alexandra LIVARDA, Georgia TSARTSIDOU, James C. WRIGHT, <i>Plant Use in Mycenaean Mortuary Practice</i>	265
Evi MARGARITIS, Katie DEMAKOPOULOU, Ann-Louise SCHALLIN, <i>The Archaeobotanical Samples from Midea: Agricultural Choices in the Mycenaean Argolid</i>	271
Evi MARGARITIS, <i>Acts of Destruction and Acts of Preservation: Plants in the Ritual Landscape of Prehistoric Greece</i>	279
Petra VAIGLOVA, Florent RIVALS, Amy BOGAARD, Rebecca FRASER, Armelle GARDEISEN, William CAVANAGH, Christopher MEE, Josette RENARD, Angela LAMB, <i>Interpreting Ancient Crop and Animal Management Strategies at Neolithic Kouphovouno, Southern Greece: Results of Integrating Crop and Animal Stable Isotopes and Dental Micro- And Mesowear</i>	287
Jörg WEILHARTNER, <i>The Influence of Aegean Iconography on the Design of the Linear B Logograms for Animals, Plants and Agricultural Products</i>	297
Marianna NIKOLAIDOU, Ernestine S. ELTER, <i>Hunting, Fishing and Gathering at Sitagroi and Beyond: Strategies of Wild Resource Use in the Neolithic and Early Bronze Age</i>	305
<b>F. Ressources animales :</b>	
Pietro MILITELLO, <i>Wool Production in Neolithic and Early Bronze Age Aegean</i>	317
Stavroula APOSTOLAKOU, Philip BETANCOURT, Thomas BROGAN, Dimitra MYLONA, Chrysa SOFIANOU, <i>Tritons Revisited</i>	325
Alexandra KARETSOU, Robert B. KOEHL, <i>The Minoan Mastiffs of Juktas</i>	333
Olga KRZYSZKOWSKA, <i>Cutting to the Chase: Hunting in Minoan Crete</i>	341
Anna Lucia D'AGATA, Sara DE ANGELIS, <i>Minoan Beehives. Reconstructing the Practice of Beekeeping in Bronze Age Crete</i>	349
Tatiana THEODOROPOULOU, <i>Excavating the Sea: Recent Advances in Marine Zooarchaeology of the Prehistoric Aegean</i>	359

Nancy R. THOMAS, <i>A Lion's Eye View of the Greek Bronze Age</i>	375
Ruth PALMER, <i>Managing the Wild: Deer and Agrimia in the Late Bronze Age Aegean</i>	391
Cyrille RIEAU, Armelle GARDEISEN, Florent RIVALS, <i>Alimentation des troupeaux durant l'âge du Bronze à travers l'analyse des micro-usures dentaires, les exemples d'Angelohori et Archontiko (Macédoine, Grèce)</i>	401
Aurélien CREUZIEUX, Armelle GARDEISEN, Evangelia STEFANI, <i>L'exploitation du monde animal en Grèce septentrionale durant le Bronze récent : l'exemple d'Angelochori</i>	409
Rena VEROPOULIDOU, <i>Molluscan Exploitation in the Neolithic and Bronze Age Communities at the Former Thermaic Gulf, North Aegean</i>	415
<b>G. Peuplement et population :</b>	
Pascal DARCQUE, Haïdo KOUKOULI-CHRYSSANTHAKI, Dimitra MALAMIDOU, Zoï TSIRTSONI, Laurent LESPEZ, Cécile GERMAIN-VALLÉE, <i>The Impact of Environmental Changes on the Neolithic Settlement of Dikili Tash (Northern Greece)</i>	425
Sylvie MÜLLER CELKA, Dario PUGLISI, Frédéric BENDALI, <i>Settlement Pattern Dynamics and Natural Resources in MM-LM I Crete: The Case of Malia</i>	431
Gert Jan VAN WIJNGAARDEN, Pavlos AVRAMIDIS, Nikolaos KONTOPOULOS, <i>Dealing with Extreme Dynamics. Prehistoric Landscapes of Zakynthos</i>	441
Michael L. GALATY, William A. PARKINSON, Daniel J. PULLEN, Rebecca M. SEIFRIED, <i>Mycenaean -Scapes: Geography, Political Economy, and the Eastern Mediterranean World-System</i>	449
<b>H. Posters :</b>	
Marcus J. BAJEMA, <i>Mycenaean Snail-Lovers?</i>	457
Dora CONSTANTINIDIS, <i>Physis and Space: Aegean Bronze Age Depictions and their Architectural Context</i>	459
Janice L. CROWLEY, <i>Images of the Earth in Aegean Art</i>	465
Mary K. DABNEY, <i>Representations of Fig Cultivation in Aegean Art</i>	469
Bryan FEUER, <i>Environmental Aspects of the Northern Mycenaean Border in Thessaly</i>	473
Walter L. FRIEDRICH, Annette HØJEN SØRENSEN, Samson KATSIPIS, <i>Santorini Before the Minoan Eruption: The Ship Fresco from Akrotiri - A Geological and Archaeological Approach</i>	475
Mercourios GEORGIADIS, <i>The Physical Environment and the Beliefs at Leska, a New Peak Sanctuary on Kythera</i>	481

Effie GEMI-IORDANOU, <i>The Meaning of Flowers: Symbolism and Interpretation of Flower Iconography in Minoan Art</i>	485
Angelos GKOTSINAS, Angeliki KARATHANOU, Maria-Fotini PAPAKONSTANTINOY, Georgios SYRIDES, Konstantinos VOVALIDIS, <i>Approaching Human Activity and Interaction with the Natural Environment Through the Archaeobotanical and Zooarchaeological Remains from Middle Helladic Agia Paraskevi, Central Greece</i>	487
Bernice R. JONES, <i>Revisiting the Figures and Landscapes on the Frescoes at Hagia Triada</i>	493
Dimitra KRIGA, <i>Flora and Fauna Iconography on Strainers and Kymbai at Akrotiri: Thera Ceramic Vessels of Special Use and Special Iconography</i>	499
Florence LIARD, <i>Mineral Resources, Potting Techniques and Social Identities in Late Bronze Age Sissi, Crete</i>	505
Stefanos LIGKOVANLIS, <i>The Exploitation of the Thesprotian Wetlands (NW Greece) During the Middle and Early Upper Palaeolithic; Different Hominins yet 'Similar' Strategies? Reflections from the Material World</i>	509
Joanne M.A. MURPHY, <i>The Wealth of Nature and the Nature of Wealth: Aspects of Pylian Ideologies</i>	513
Heleni PALAIOLOGOU, <i>Water Management, Climatic, Social Changes and Agriculture in the Plain of Mycenae during the 13<sup>th</sup> C. B.C. and Later: The Case of Chania</i>	517
Christina PAPOULIA, <i>Confronting the Sea: Navigation Skills in Pre-Modern Human Societies</i>	521
Vassilis P. PETRAKIS, <i>The Religious Significance of Insects in the Aegean Bronze Age: Three Notes</i>	525
Anna PHILIPPA-TOUCHAIS, Gilles TOUCHAIS, Oreste DECAVALLAS, Armelle GARDEISEN, Matthieu GHILARDI, Evi MARGARITIS, Odysseas METAXAS Sevi TRIANTAPHYLLOU, Efi TSIOLAKI, <i>Environnement, alimentation, hygiène et mode de vie dans la Grèce mésohelladique : le cas de l'Aspis d'Argos</i>	531
Maria ROUSSAKI, <i>New Evidence in Minoan Pictorial Wall Painting: 'The Swallows Fresco' from the Knossos Area</i>	539
Alessandro SANAVIA, <i>How to Improve on Nature: Some Middle Minoan Triton Shells from Phaistos (Crete)</i>	543
Robert SCHON, <i>The Political Ecology of the Pylian State</i>	547
Andrew SHAPLAND, <i>After Naturalism: Human-Animal Relations in LMII-III Crete</i>	555

Giorgos VAVOURANAKIS, <i>The Changing Significance of Nature within Minoan Society</i>	559
<b>I. En guise de conclusion ...</b>	
Thomas G. PALAIMA, <i>The Linear-B-Inscribed Triton PAR Ph 2012 and its Lessons about Phusis</i>	563

**PHYSIS AND TECHNE ON THERA:  
RECONSTRUCTING BRONZE AGE ENVIRONMENT AND LAND-USE  
BASED ON NEW EVIDENCE FROM PHYTOLITHS  
AND THE AKROTIRI WALL-PAINTINGS**

The research project presented in this paper aims to reconstruct the Bronze Age environment and land use on the island of Thera prior to the volcanic eruption in the early Late Bronze Age (c. 1600 BC). Based on a wide range of combined evidence, the paper seeks to trace patterns of exploitation of the island's natural resources by the local community. Along with the excellently preserved material culture, we can start to understand past aspects of the island landscape through a range of newly available analytical approaches. In earlier years, the scarcity of proxies of local environmental change has allowed significantly different reconstructions of the habitat and vegetation variability to develop.

Situated in the southern Aegean in what is today known as the Cycladic Archipelago, an area of intense tectonic activity, Thera was placed in a geographically advantageous location for trade and communication, being the southernmost call-port of the Cyclades. The cataclysmic eruption blanketed the island with a more than 30 meters thick deposit of tephra, sealing underneath it the Late Cycladic land surface. This volcanic ash has preserved in situ evidence for an entire geobotanical system.

Previous reconstructions of Bronze Age Thera have suggested that the prosperity of the town of Akrotiri depended on its advantageous geographical position in the centre of the southern Aegean, at an easily navigable distance of 70 n.m. from the north coast of Crete. In the present paper it is argued that, although maritime trade played a significant role in that respect, the affluence of Theran society was also due to an extensive exploitation mechanism of the landscape. It is conjectured that the conditions on Thera were less arid than today and, therefore, it was possible to exploit more crops. The occurrence of small settlements and individual buildings across the landscape implies that various agricultural subsistence strategies were also practised. Finally, phytolith analysis indicates both regional as well as local variations in vegetation.

### **Challenging “Nilotic” Preconceptions**

In the Aegean prehistoric archaeology several terms referring to iconography reflect modern preconceptions and cause bias in the interpretation. Such is the case with the use of the term ‘Nilotic’, associated with several inconsistencies. The term describes the iconography of riverine or shore landscapes, which was introduced at the time of Mycenae Grave Circle A, during the New Palatial period of Minoan Crete, namely, in the 16th century BC, in terms of low chronology, and the beginning of the 17th century BC, in terms of high chronology. On the other hand, the described by the same term Egyptian representations are known mainly from royal tombs of the ‘Valley of the Kings’ in Thebes and date to the 18th Dynasty (beginning of the 14th century BC), with only few examples assigned to an earlier phase<sup>1</sup>. The term ‘Nilotic’ was then brought into the Aegean from the Egyptian iconography, despite the fact that the Aegean monuments, although more recently unearthed, predate by several decades the Egyptian ones<sup>2</sup>.

1 A. LHOPE, *Les chefs-d'oeuvre de la peinture égyptienne* (1954) pl. 6, 52-53, 54, 58-59; C.K. WILKINSON – M. HILL, *Egyptian Wall Paintings* (The Metropolitan Museum of Art's Collection of Facsimiles, 1983) 40-41, 108, 121, 148-149; S.A. IMMERSWAHR, *Aegean Painting in the Bronze Age* (1990) 35, 49, 62 pl. 5-7, 17; A. ΚΑΡΕΤΣΟΥ – Μ. ΑΝΔΡΕΑΔΑΚΗ-ΒΛΑΖΑΚΗ (επιμ.), *Κρήτη-Αίγυπτος. Πολιτισμικοί δεσμοί τριών χιλιετιών. Κατάλογος* (2000) 282-284 nos 279-282. See A. ΒΛΑΧΟΠΟΥΛΟΣ, “Η ‘τοιχογραφία του Δονακώνος’ από το κτήριο Ξεστή 3 του Ακρωτηρίου,” in ΧΡ. ΝΤΟΥΜΑΣ (επιμ.), *Ακρωτήρι Θήρας, 30 χρόνια έρευνας. Διεπιστημονική Συνάντηση 19-20 Δεκεμβρίου 1998* (2008) 280-281.

2 A. VLACHOPOULOS, “The Reed Motif in the Thera Wall-Paintings and Its Association with Aegean Pictorial Art,” in S. SHERRATT (ed.), *Proceedings of the First International Symposium on the Wall Paintings of Thera, Ίδρυμα Θήρας Πέτρος Μ. Νομικός, Θήρα, Αύγουστος 1997* (2000) 646.



As 'Nilotic' landscapes are usually interpreted small-scale iconographic compositions (on minor arts objects, seals and sealings) as much as monumental iconography (wall-paintings), generally not comprising typically Mediterranean coastal landscapes, defined by typical for them flora and fauna, but including mostly settings of a sub-tropical climatic zone where leopards, lions, monkeys, ducks and wetland plants as well as mythical creatures (such as griffins and sphinxes) would have been 'at home'. These landscapes were considered to be examples of iconographic stereotypes, which reciprocated a mutual background between the Aegean and Egypt as well as the East, in general. This interaction was archaeologically documented through the Middle Minoan II relief pottery (19th-18th century BC) bearing depictions of a wildcat in a tree landscape, sea animals and hawks from building D of Quartier Mu of Malia<sup>3</sup>. Relief pottery from the Vrysinas peak-sanctuary, adopting the same repertoire, has been recently published, dated, too, to the Middle Minoan II-III periods<sup>4</sup>.

It has been of little concern to what extent the supposed 'Egyptian' ecosystems may depict actual Aegean landscapes of the time. Indeed, the great number of bibliographic references using the term 'Nilotic' imposes an a priori concept of exoticism<sup>5</sup>.

The iconography of the Akrotiri wall-paintings was characterized by S. Marinatos, the first excavator of the site, as a multifaceted 'presentation' of activities conducted by humans and animals in natural settings, its themes having been seen as 'religious' or 'Minoan' in character, in a context where the two terms were regarded as synonymous<sup>6</sup>. At the same time, Marinatos remarked that the "Spring Fresco" from Sector Delta, the colourful rocky landscape of the Miniature Frieze from the West House and the wall-painting of the Blue Monkeys from Building Beta as well as those from Xeste 3 were displaying lava formations. Geological traits of this kind are still visible throughout the pre-eruption landscape of Thera, especially along the south-west edge of the Akrotiri settlement (Kokkino Vouno<sup>7</sup>). In fact, Marinatos used the term 'Nilotic' only for the East Miniature Frieze, but over the decades this composition has come to be recognized as the epitome of the 'Nilotic landscape' in the Aegean iconography<sup>8</sup>.

Arthur Evans made use of the term 'Nilotic' much earlier, in 1906, in relation to Minoan art, later on, though, in 1925, he adopted it as a geographical and chronological definition of the early Egyptian civilization<sup>9</sup>. In later years, several other scholars have used the term both unconventional and literal ways<sup>10</sup>.

- 3 J.-C. POURSAT, "Relief d'applique moulés," in B. DETOURNAY, J.-C. POURSAT and F. VANDENABEELE, *Fouilles exécutées à Mallia. Le quartier Mu II* (1980) 120-122 figs 170-174; K.P. FOSTER, *Minoan Ceramic Relief* (1982) 87, 88 fig. 38; ΚΑΡΕΤΣΟΥ - ΑΝΔΡΕΑΔΑΚΗ-ΒΛΑΖΑΚΗ (*supra* n. 1) 54, 56-57 nos 30-32.
- 4 I. ΤΖΑΧΙΛΗ, *Βρύσινας I. Μινωικά Εικαστικά Τοπία. Τα αγγεία με τις επίθετες πλαστικές μορφές από το Ιερό Κορυφής του Βρύσινα και η αναζήτηση του βάθους* (2011) 40-92; I. ΤΖΑΧΙΛΗ, "Vases with plastic decoration depicting landscapes from the Vrysinas Peak Sanctuary," in A. VLACHOPOULOS (ed.), *Proceedings of the workshops Χρωστίρες / Paintbrushes. Wall-painting and vase-painting of the 2<sup>nd</sup> millennium BC in dialogue, Aktotiri, Thera, 25-26 May 2013* (forthcoming).
- 5 P. MILITELLO, "Nilotic Models and Local Reelaboration: The Hagia Triada Example," in A. ΚΑΡΕΤΣΟΥ, (ed.), *Κρήτη-Αίγυπτος. Πολιτισμικοί δεσμοί τριών χιλιετιών. Μελέτες* (2000) 78-85; A. ASHTON ULLMAN, *The Aegean Nilotic Landscape: Interconnections Between Egypt and the Aegean During the Late Bronze Age* (Thesis M.A., University of Oregon, 1987). See also J. VANSCHOONWINKEL, "Animal Representations in Thera and other Aegean Arts," in D.A. HARDY (ed.), *Thera and the Aegean World III, Proceedings of the Third International Congress Santorini, Greece, 3-9 September 1989*, Vol. I *Archaeology* (1990) 337.
- 6 ΧΡ. ΝΤΟΥΜΑΣ, "Η θρησκεία στο Ακρωτήρι," in ΝΤΟΥΜΑΣ (*supra* n. 1) 335, 357-358; A. VLACHOPOULOS "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. DAVIS, S. STOCKER (eds), *Mycenaean Wall-Paintings in Context. New Discoveries and Old Finds Reconsidered, Athens 11-13.2.2011* (forthcoming).
- 7 VLACHOPOULOS (*supra* n. 6); A. ΒΛΑΧΟΠΟΥΛΟΣ, "Κόκκινο Βουνό: μία πέριξ του άστεως εγκατάσταση στο Ακρωτήρι," *Αλφ* 8, 2014 (forthcoming).
- 8 E. DAVIS, "The Iconography of the Ship Fresco from Thera", in W.G. MOON (ed.), *Ancient Greek Art and Iconography* (1983) 5; L. MORGAN, *The Miniature Wall Paintings of Thera. A study in Aegean Culture and Iconography* (1988) 146-148 pl. 187-188 col. pl. B; X. ΤΕΛΕΒΑΝΤΟΥ, *Οι Τοιχογραφίες της Δυτικής Οικίας* (1994) 59, 82-83, 87, 196-198, 248, 258, 316 col. pl. 45-53.
- 9 A. EVANS, "The Early Nilotic, Libyan and Egyptian Relations with Minoan Crete," *The Huxley Memorial Lecture for 1925, The Journal of the Royal Anthropological Institute of Great Britain and Ireland*; A. EVANS, "The 'Ring of Nestor': A Glimpse into the Minoan After-World," *JHS* 45 (1925) 66.
- 10 E. VERMEULE, *Greece in the Bronze Age* (1964) 107: "The scenes from the Nile with the leopards chasing the ducks on the river, in a swamp with papyrus, is the least Greek imagery".

We are faced here with a discrepancy in terms of iconography and, more importantly, with a chronological one too. Leopards do not hunt along the Nile but in the savannas of the tropical zone, while wildcats did exist and still do in the Aegean<sup>11</sup>. Furthermore, the armed warriors depicted fighting lions on a contemporaneous dagger from the Shaft Graves of Mycenae are not so much Egyptian as they are Mycenaean figures. The latter case evokes chronological ambiguity, since the Aegean 'Nilotic' representations are two or more centuries earlier in date. As a matter of fact, it is when 'Nilotic' iconography drops out of the thematic repertoire in the Aegean (LM /LH II period<sup>12</sup>) that begins in Egypt (18th Dynasty). This issue is still under discussion and, in all probability, facts relating to its interpretation cannot have been one-sided nor bidirectional between the Eastern Mediterranean and the Aegean in the second millennium BC<sup>13</sup>.

### Late Cycladic I Landscape and Environment of Thera

In order to complete the picture and attempt to reconstruct the Bronze Age landscape and environment, we must take into consideration data from both on and off site research. In recent years, surface surveys have led to a new emphasis on the ways in which settlements appeared and disappeared over time<sup>14</sup>. Despite this development, archaeologists tend to focus on 'the site', ignoring or paying little attention to the environs. Indeed, many archaeological studies present reconstructions of prehistoric landscapes, often leaving out contemporary research evidence for the landscape itself, relying only on data extrapolated from its modern aspects. With regard to Thera, valid is the observation that, although the landscape and environment of the island changed significantly after the Late Cycladic I eruption, stretches of its earlier formation are preserved in situ.

The Thera archipelago islands are all that has been left from an originally ring-shaped island<sup>15</sup>. Characterised by species that thrive in dry conditions, the modern flora of the main island of Thera is adapted to the local climatic regime, having, in general, been strongly influenced by the introduction of plants by humans<sup>16</sup>. The modern landscape is dominated by phrygana and the primary domesticated plant is vine. Although some olive trees and several types of fig trees are present, Thera is virtually treeless.

The geology of the island is composed of a metamorphosed sediment core and complex volcanic deposits. In this context, quite important is the fact that the Late Cycladic I eruption occurred after a long period of limited volcanic activity lasting more than 14,500 years<sup>17</sup>. Through this large chunk of time palaeosols developed uninterrupted by volcanic activity until the Late Bronze Age (Pl. LVIA).

In the excavated area of Akrotiri a rather large number of about 35 buildings have been identified so far, but it is clear that the town expanded in all directions<sup>18</sup>, as investigations conducted on Kokkino Vouno indicated<sup>19</sup>. Of particular importance also are smaller clusters of buildings in neighbouring areas the most noteworthy among them being a recently excavated one at Raos<sup>20</sup>, at the northern edge of the post-eruption caldera (north of Akrotiri). Major

11 IMMERWAHR (*supra* n. 1), 115 figs 29-30; MORGAN (*supra* n. 8), 146-148 pl. 186; P. MILITELLO, *Gli Affreschi Minoici di Festòs* (2001) 180 pl. 5-6, 17.

12 The best example of this period is the ivory comb from Routsis, Messinia: Γ. ΣΑΚΕΛΛΑΠΑΚΗΣ - Ε. ΚΩΝΣΤΑΝΤΙΝΙΔΗ-ΣΥΒΡΙΔΗ, "Ελεφάντινα κτένια από τη μυκηναϊκή συλλογή του Εθνικού Αρχαιολογικού Μουσείου," *AE* 149 (2010) 145-208.

13 R. KOEHL, "The Near Eastern Contribution to Aegean Wall Painting and Vice Versa," in J. ARUZ, S.B. GRAFF, Y. RAKIC (eds), *Cultures in Contact. From Mesopotamia to the Mediterranean in the Second Millennium B.C., The Metropolitan Museum of Art Symposia* (2013) 170-179; R. KOEHL, "From Pot Patterns to Pictures: Thoughts on the Evolution of Aegean Wall Painting," in VLACHOPOULOS ed. (*supra* n. 4).

14 H. FORBES, *Meaning and Identity in a Greek Landscape: An Archaeological Ethnography* (2007) 1.

15 G. VOUGIOUKALAKIS, "The Minoan eruption and the Aegean World," *Αλς* 4 (2006) 22-25 figs 1, 17.

16 O. RACKHAM, "Observations on the historical ecology of Santorini," in HARDY ed. (*supra* n. 5, II) 386.

17 H. PICHLER - W.L. FRIEDRICH, "Mechanism of the Minoan eruption of Santorini," in HARDY ed. (*supra* n. 5, II) 15-30.

18 C. PALYVOU, *Akrotiri Thera. An Architecture of Affluence 3,500 Years Old* (2005) 26-29 fig. 25.

19 S. MARINATOS, *Excavations at Thera II* (1969) 35-36; VLACHOPOULOS (*supra* n. 7).

20 M. MARTHARI, "Raos and Chalarovounia. Preliminary Evidence from two new sites of the Late Cycladic

architectural features of the Akrotiri buildings include multi-storeyed structures and impressive façades of ashlar masonry (xeste). The winding, of varying width streets indicate that there was no systematic layout in terms of town planning<sup>21</sup>. On the other hand, the complex drainage system unearthed in Sector A and along the House of the Ladies, Telchines road, West House and Complex Delta North-West, Xeste 5 and Complex Delta East and Xeste 3 attests to a rudimentary form of communal planning<sup>22</sup>. Buildings are clustered together betraying increased construction activities in the urban centre, as the four insulae of Sector Delta clearly demonstrate<sup>23</sup>. Brightly coloured stones, such as tuff, ignimbrite and gypsum, have been used on the façades of certain buildings, probably creating distinct visual contrasts<sup>24</sup>. The majority of the buildings are adorned with elaborate wall-paintings in at least one or two of their rooms<sup>25</sup>. Many of the wall-paintings depict landscape scenes and a large variety of plants<sup>26</sup>.

The excavations of Akrotiri brought to light macrobotanical remains of staple crop plants, such as barley, lentil, common pea, and wheat, on which the local farming economy was obviously based<sup>27</sup>. There were also recorded olive stones and charred remains of vines and figs.

Particularly interesting aspects of the island ecology surfaced through E. Asouti's study of wood charcoal, found in one of the excavation trenches<sup>28</sup>. About 15 taxa are believed to have grown locally including olive, pine, and oak along with maquis and shrubs. Also important is the likely occurrence of reeds and tamarisk as indicators of more localised waterside vegetation that could have grown on stream banks and at the edges of marshes. Moreover, the evidence of wood charcoal remains suggests highly variable vegetation and potentially some kind of woodland. Within the settlement of Akrotiri, a complete tree (most likely an olive tree or tamarisk) was retrieved in the open area south-east of Sector A. More precisely, a plaster cast mould taken from the impression that tree has left down the archaeological deposit preserves in great detail its original shape (Pl. LVib)<sup>29</sup>.

Up to now, there has been carried out only one palynological study on the island<sup>30</sup>, recording pollen that was preserved within the first volcanic horizon and would have blown into the area at that time. As a result, a large number of pollen grains have been identified and appear to come from olive trees, pine, oak, vine and various shrubs.

Information on the landscape can also be obtained from the abundance of local stone sources, which provided the raw materials the plethora of stone tools and vessels found at Akrotiri were manufactured from<sup>31</sup>. Moreover, due to the unique conditions of preservation

---

I period on Thera," *Αλς 2* (2004) 53-65; M. MARTHARI, "The Attraction of the Pictorial' Re-considered. Pottery and wall-paintings in LC I Thera in the light of the latest research," in VLACHOPOULOS ed. (*supra* n. 4). At the same time, it is quite unlikely that the town extended so far north, up to the caldera rim, judging from the configuration of the terrain and ample space available. The site of Raos must have been a neighbouring smaller independent cluster of buildings.

21 PALYVOU (*supra* n. 18) 29-39 fig. 26-36; ΦΡ. ΓΕΩΡΓΙΑ - Φ. ΣΟΦΙΑΝΟΥ, "Υπαίθριοι χώροι και αποχετευτικό σύστημα: διαχρονική μελέτη βάσει των νέων στρωματογραφικών δεδομένων," in ΧΡ. ΝΤΟΥΜΑΣ (ed.), *Ακρωτήρι Θήρας. 40 χρόνια Έρευνας (1967-2007). Επιστημονική συνάντηση 15-16 Δεκεμβρίου 2007* (forthcoming).

22 PALYVOU (*supra*) 39-43 fig. 42.

23 PALYVOU (*supra*) 71-83 figs 90-110.

24 PALYVOU (*supra*) 113-114 col. pl. C.

25 C. DOUMAS, "La répartition topographique des fresques dans les bâtiments d'Akrotiri à Théra," in I. BRADFER, B. DETOURNAY and R. LAFFINEUR (eds), *ΚΡΗΣ ΤΕΧΝΙΤΗΣ. 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* (2005) 73-81.

26 A. SARPAKI, "Plants Chosen to be Depicted on Thera Wall Paintings," in SHERRATT ed. (*supra* n. 2) 657-680.

27 C. DOUMAS, "Bringing to life a dead city at Akrotiri on the island of Thera," *Αλς 1* (2003) 25, 47 fig. 7.

28 E. ASOUTI, "Wood charcoal from Santorini (Thera): new evidence for climate, vegetation and timber imports in the Aegean Bronze Age," *Antiquity* 297 (2003) 471-484.

29 The plaster cast mould of the tree was extracted during the 2003 excavation season at Akrotiri, at the time when the trenches for the foundations of the pillars for the new roof of the site were investigated. I. MICHAELIDIS - P. ANGELIDIS, "Conditions of Preservation of Organic Materials of Vegetal Provenance in the Prehistoric Settlement at Akrotiri," *Αλς 4* (2006) 75 fig. 21. Our thanks go to Prof. C. Dumas for giving us permission to illustrate it in this paper.

30 VOUGIOUKALAKIS (*supra* n. 15) 37.

31 A. ΔΕΒΕΤΖΗ, "Τα εισηγμένα λίθινα αγγεία του Ακρωτηρίου. Μία νέα προσέγγιση," in ΝΤΟΥΜΑΣ ed. (*supra* n. 1)

prevailing at Akrotiri, organic items, such as textiles<sup>32</sup>, baskets<sup>33</sup> and nets<sup>34</sup>, the raw materials for which were acquired through the exploitation of local plants, have been recovered from the site. Finally, goods listed in the Linear A (Theran) fragmentary clay tablets, found in Sector D, record flocks of sheep and large quantities of textiles testifying to the intensive animal husbandry practised on the island<sup>35</sup>.

This paper examines the pre-eruption landscape mantled by volcanic ash, but also accessible for investigation around the circumference of the present caldera, as well as down numerous erosion cuts, providing a series of exposures distributed across most topographic contexts (Pl. LVIc). The recorded evidence and phytolith sampling for analysis discussed here form part of the research L. Zorzos conducted for his doctoral thesis currently under completion at the Institute of Archaeology, University College London<sup>36</sup>.

### The Importance of Landscape Use and Connectivity with the Inhabitants

In the process of locating geological exposures, quite a few artefacts have been identified. Indeed, archaeological remains are evident throughout the island. The most commonly occurring material culture is pottery and stone tools in low-density scatters. Visible, but less frequent, are architectural remains and fragments of painted plaster. This type of evidence is rather difficult to interpret as it may represent either just randomly dispersed sherds in a field, for instance in the course of agricultural manuring activities, or literally be the ‘tip of the iceberg’ of an underlying settlement site. So far Akrotiri appears to have been the only major town on the island, notwithstanding the fact that several buildings have been excavated in the modern pumice quarries and architectural remains are often exposed across the landscape<sup>37</sup>.

Soil sampling along the exposures has shed new light on the nature and distribution of cultivated and fallow fields, orchards, grazing lands and scrub areas (Pl. LVIId). It has also provided data on specific cultivation practices by detecting the presence and layout of agricultural terraces and manuring regime. The pre-eruption land surface and sample spots have been meticulously mapped against topography, slope gradient and slope aspect, and underlying geology to put together a detailed reconstruction of landscape exploitation at the time of the eruption, precisely synchronous with the already studied on-site evidence from Akrotiri.

Phytolith analysis is a relatively new and developing field in archaeobotanical research<sup>38</sup>.

- 
- 453-474.
- 32 Γ. ΣΠΑΝΤΙΔΑΚΗ – C. MOULHERAT, “Υφάσματα στο Ακρωτήρι. Λεπτά, απλά αλλ’ όχι απλοϊκά,” in ΝΤΟΥΜΑΣ ed. (*supra* n. 21); Σ. ΣΠΑΝΤΙΔΑΚΗ, “Ανακατασκευή λινού υφάσματος από το Ακρωτήρι,” *Αλς* 7 (2009-2010) 75-84.
- 33 Μ. ΜΠΕΛΟΠΙΑΝΝΗ, “Η καθαθοπλεκτική και η ψαθοπλεκτική τέχνη στην οικονομία του Ακρωτηρίου,” in ΝΤΟΥΜΑΣ ed. (*supra* n. 1) 199-214; Μ. ΒΕΛΟΥΑΝΝΙ, “Basketry: a diachronic art, and its products at prehistoric Akrotiri,” *Αλς* 5 (2007) 46-88.
- 34 ΜΙΧΑΗΛΙΔΗΣ - ΑΓΓΕΛΙΔΗΣ (*supra* n. 29) 74 fig. 18, 81 fig. 40; Κ. ΤΡΑΝΤΑΛΙΔΟΥ, “Η Αρχαιοζωολογική έρευνα στην Ανασκαφή του Ακρωτηρίου. Ο ζωικός κόσμος στην καθημερινή ζωή και στην ιδεολογία,” *Αλς* 6 (2008) 42, fig. 20.
- 35 Χ. ΜΠΟΥΛΩΤΗΣ, “Οι πινακίδες Γραμμικής Α από το Ακρωτήρι (THE 7-12): όψεις της οικονομικής ζωής του οικισμού,” in ΝΤΟΥΜΑΣ ed. (*supra* n. 1) 67-94. See also ΤΡΑΝΤΑΛΙΔΟΥ (*supra* n. 34) 47-48, 50, 66-67, fig. 27, 39, 56; Κ. ΤΡΑΝΤΑΛΙΔΟΥ, “Η προβατοτροφία στο ΥΚ Ι Ακρωτήρι και ο αποθέτης των κεράτων,” in ΝΤΟΥΜΑΣ ed. (*supra* n. 21).
- 36 L. ZORZOS, *Reconstructing Bronze Age environment and land-use on Thera, a phytolith-based approach* (PhD research in progress). See also Λ. ΖΩΡΖΟΣ, “Η συμβολή των φυτολίθων στη μελέτη του προεκραϊακού ΥΚ Ι τοπίου και περιβάλλοντος,” in ΝΤΟΥΜΑΣ ed. (*supra* n. 21).
- 37 The bulk of the architectural evidence refers to numerous individual buildings and some clusters of less than ca. 5 buildings in areas such as Megalochori Quarry, Fira Quarry, Therasia, Raos, Apothikes, Kokkino Vouno and Chalarovounia. More extensive evidence found recently is located in the area west of Vlichada (the coast east of Akrotiri) where extensive exposures have been identified and artefacts are visible in all sections within a 500 m. radius.
- 38 Phytoliths are microscopic mineralized bodies formed in living plants, composed of amorphous silica brought into the plant through the uptake of water, and formed within and between cells. Phytoliths are not organic and they are not subject to the same processes of decay that lead to the destruction of uncharred plant remains and pollen grains. They come from plant parts, such as stems, leaves and husks, which are rarely represented by macro-botanical remains, and therefore specific information can be inferred from the

It is their durability that gives phytoliths the potential to be an exceedingly valuable data source for archaeological research. All the more so for Thera as the Late Bronze Age land surface, covered under volcanic tephra and perfectly preserved, was not affected by subsequent cultivation nor natural weathering processes.

However, it is inevitable for the application of a single technique like this not to show signs of unevenness in the overall quality of information available. Some plants produce very few or no phytoliths at all. The vine, one of the plants known to be a significant component of prehistoric Aegean landscapes, does not form phytoliths. Other crops with noteworthy presence in the Aegean region, such as peas, lentils, and beet, deposit very few or of no taxonomic significance phytoliths<sup>39</sup>. It is only the olive that produces phytoliths in the leaves, when occurring within a dense concentration of trees<sup>40</sup>. These are important limitations concerning key plants of the Aegean ecosystem and their presence in the landscape will not necessarily be monitored in the phytolith assemblage. Furthermore, these limitations determine, to a certain degree, the kind of research questions that can be addressed through phytolith analysis.

The overall densities observed in the processed samples indicate that, in their large majority, primarily contained phytoliths and volcanic material, but also a substantial percentage of diatoms. Diatoms are a major group of algae, composed of biogenic silica and, are therefore, preserved like phytoliths<sup>41</sup>. It is important to emphasize that in the case of Thera diatoms have been identified in contexts that lie several meters above sea level. Both the nature of the contexts and the type of diatoms present suggest that they are ‘soil diatoms’, only rarely preserved in older sediments. These are diatoms that can grow in damp areas, usually beneath shade and do not need to be submersed as most other forms of diatoms.

The picture emerging on the basis of the evidence from the Thera samples is that grasses and sedges dominated the pre-eruption landscape. And it is the occurrence of phytoliths of these plants that documents the prevalence of wet environmental conditions in the pre-

---

use of each part. After the plants die and decay, their phytoliths are released into the uppermost horizons of the soil. Phytolith preservation varies as different dissolution occurs because of the specific type of phytolith and the chemical and physical characteristics of the depositional environment. See also: E.L. HARVEY - D.Q. FULLER, “Investigating crop processing using phytolith Analysis: the example of rice and millets,” *Journal of Archaeological Science* 32 (2005) 739-752, 739; D.R. PIPERNO, *Phytoliths: a comprehensive guide for archaeologists and palaeoecologists* (2006) 5; L. ZORZOS, “Phytolith Analysis: Microscopic Evidence for Plant Food Exploitation,” in C. RENFREW, O. PHILANIOTOU, N. BRODIE, G. GAVALAS and M.J. BOYD (eds), *The settlement at Dhaskalio The sanctuary on Keros and the origins of Aegean ritual practice: the excavations of 2006–2008*, Volume I (2013) 405-415.

39 ZORZOS (*supra*) 406.

40 See above n. 29. The olive tree can be safely identified with the bushy-branched tree that is coming out from the façade of the ‘shrine’, on the east wall of the ‘adyton’ of the Xeste 3 building (room 3a, ground floor): A. VLACHOPOULOS, “Mythos, Logos and Eikon. Motifs of Early Greek Poetry and the Wall Paintings of Xeste 3, Akrotiri,” in R. LAFFINEUR - S. MORRIS (eds), *EPOS. Reconsidering Greek Epic and Aegean Bronze Age Archaeology, Proceedings of the 11<sup>th</sup> International Aegean Conference, UCLA, 21-23 April 2006, Aegaeum* 27 (2007) 109 pl. XXVIA. An olive tree wig has been apparently cut off this tree and ornaments the hair of the “Wounded Lady”, the central figure on the north wall of the ‘adyton’, see C. DOUMAS, *The wall paintings of Thera* (1992) 129-130 pl. 100-108. A fruited olive tree wig is depicted on the snood of the “Fifth Lady” from the first floor (Pl. LXIIa-b), see: A. VLACHOPOULOS, “The Wall Paintings from the Xeste 3 Building at Akrotiri, Thera. Towards an Interpretation of Its Iconographic Programme,” in N. BRODIE - J. DOOLE - G. GAVALAS - C. RENFREW (eds), *Οπίζων. Symbolism, Interactions, Centrality. Recent Work on the Prehistory of the Cyclades, McDonald Institute for Archaeological Research, University of Cambridge 25-28.3.2004* (2008) 453 fig. 41.38-40; VLACHOPOULOS 2007 (*supra* this n.), 114 pl. XXXI; A. VLACHOPOULOS, “L’espace rituel revisité : architecture et iconographie dans la Xeste 3 d’Akrotiri, Théra,” in I. BOEHM - S. MÜLLER (eds), *Espace civil, espace religieux en Egée durant la période mycénienne. Approches épigraphique, linguistique et archéologique. Actes des journées d’archéologie et de philologie mycénienne tenues à la Maison de l’Orient et de la Méditerranée – Jean Pouilloux les 1er février 2006 et 1er mars 2007* (2010) 179-180, 183; A. VLACHOPOULOS - F. GEORMA “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 13<sup>th</sup> International Aegean Conference, University of Copenhagen, Danish National Research Foundation’s Centre for Textile Research, 21-26 April 2010, Aegaeum* 33 (2012) 39 pl. XVII.c. A pair of wooden clappers and a third one found together in Xeste 4 were made of olive-tree wood, see M. MIKPAKHΣ, “Ξύλινα χειρόμορφα κρόταλα από το Ακρωτήρι,” *Αλς* 5 (2007) 89–96.

41 Battarbee, pers. com.

eruption island (Pl. LVIIa). It must be emphasized that because of these conditions, a greater quantity of phytoliths from grasses and sedges has been deposited into the palaeosols. Indeed, sedge phytoliths and diatoms are abundantly present in several geological exposures but not in those in the north part of the island. Climatic factors as well as depressions in the topography that collected water, then, favoured the growth of moderately moist plants.

Along with the large number of Cyperaceae there is also evidence for other morphotypes and specific dicot phytoliths such as jigsaws, sheets, mesophyl and polyhedrons, which come from trees and shrubs and can indicate wet conditions<sup>42</sup> (Pl. LVIIb). The area with the largest number of polyhedral phytoliths is situated in the Megalohori region and specifically in the surroundings of the Mavromatis quarry. So far there are no data to substantiate the existence of a patchy forest on the island, but nonetheless the phytolith evidence and charcoal analyses by E. Asouti indicate that there was enough wood for exploitation by the local inhabitants. Quite remarkably, recent work by K. Papagiannis ascertained the presence of micro fauna in Akrotiri that is associated with densely wooded areas<sup>43</sup>.

In order to reconstruct the landscape we can briefly look at specific contexts and establish what the vegetation was like in each location. The best evidence that fresh water existed in the pre-eruption landscape comes from the Fira Quarry (Pl. LVIIc). The large number of diatoms, sedges and reed grass bulliforms allows us to visualize the location as a shallow fresh-water wetland. The overlaying pumice deposit recorded at the site was different from what is usually evident above palaeosols. Although the pumice corresponded to the first major phase, the 5 cm thick layer above the palaeosol was not solidified, as it would have been expected, but it appeared to be liquefied, despite the absence of the intervening precursor phase of the eruption. It could then be inferred that because of the wet state of the ground, the lowest part of the pumice fill had 'reacted' differently upon impact with the palaeosol. The phytolith evidence, along with the very large number of diatoms indicates that there was standing fresh water in this area. To the presence of water could be related two excavated nearby Late Cycladic buildings, which have been described by C. Doumas as farmsteads because of their architecture and artefact typology<sup>44</sup>. A steep slope gradient is also recorded in this area running from west to east, having possibly formed some kind of depression in the topography.

The area sampled in the quarry at Mavromatis lies 100 meters west of what are believed to be Late Cycladic farmsteads (Pl. LVIIId). Even within the dark brown palaeosol, one can still discern fine painted local and imported pottery. Data obtained from these samples demonstrate that throughout the section there is a substantial number of bulliform phytoliths deriving primarily from reeds. Furthermore, they contained a considerable amount of phytoliths from dicot leaves and sedges implying that the local vegetation comprised primarily moderately moist plants. On the other hand, the presence of wheat husk multi-cells (Pl. LVIIIa) can be linked to the aforementioned farmsteads. The palaeosols in this area appear to be particularly fertile, while the fact that the site is in close proximity to the settlement of Akrotiri could explain the emerging pattern of extensive exploitation.

All in all, the attributes for wheat and barley have been traced in several samples from different parts of the island. It is not expected, however, that large numbers of husks will be found in the fields as they were usually removed along with the crop and separated in the processing, which, as a rule, was carried out within the settlements.

42 G. TSARTSIDOU, G. LEV-YADUN, R.M. ALBERT, A. MILLER-ROSEN, N. EFSTRATIOU and S. WEINER, "The Phytolith Archaeological Record: Strengths and Weaknesses Evaluated Based on a Quantitative Modern Reference Collection from Greece," *Journal of Archaeological Science* 34 (2007) 1262-1275. This study has shown that jigsaw puzzle phytoliths indicate wetter climates or ancient irrigation. See also: A.M. ROSEN, "Phytoliths as indicators of prehistoric irrigation farming," in P.C. ANDERSON (ed.) *Prehistory of Agriculture: New Experimental and Ethnographic Approaches*. Los Angeles, UCLA Institute of Archaeology (2007) 193-198.

43 Κ. ΠΑΠΑΓΙΑΝΝΗ, *Η συμβολή της μικροπανίδας στη μελέτη του παλαιοπεριβάλλοντος του Αιγαίου: οι περιπτώσεις του Ακρωτηρίου Θήρας, του Χαλινομουριού Κρήτης και του σπηλαίου Λεοντάρι Αττικής* (unpublished PhD, University of Athens). See also ΤΡΑΝΤΑΛΙΔΟΥ (supra n. 34) 37 fig. 14.

44 C. DOUMAS, "A lonely steading in Late Bronze Thera," *Αλς* 4 (2006) 82-91

### Phytoliths and the Iconography from Akrotiri

We can now compare the phytolith evidence with the iconography from Akrotiri that has formed the basis for previous reconstructions. The wall-paintings are particularly significant as they depict what the local inhabitants viewed as important about their landscape and environment. At the same time, we must be cautious about what the artists are trying to communicate and whether it is of the ‘real world’, something symbolic and imagined, or simply very selective<sup>45</sup>.

We need to consider:

How stereotypical are the species of flora depicted in the Thera wall-paintings? To what extent is their thematic selection performed according to a ‘repertoire’, ‘iconographic cycle’ or symbolic unit? In fact, it is quite crucial that, as it has already been successfully established initially for the crocus (Marinatos<sup>46</sup>, Tzahili<sup>47</sup>, Sarpaki<sup>48</sup>) and, more recently, for the reeds (Vlachopoulos<sup>49</sup>), these two reoccurring on the Akrotiri wall-paintings plants were depicted in their local natural setting (Cycladic - Thera). By adding the Madonna lily, which sprouts from the colourful lava rocks, on both ceramic vase and wall-painting compositions<sup>50</sup>, the present study will show exactly that to be the case with several of the landscape wall-paintings of Akrotiri.

The sedge and dicot phytoliths and diatoms found in the Thera samples have produced a set of substantial data for our reconstruction, since the specified evidence thus acquired provides direct environmental feedback to the debate about whether specific plants could grow in the Aegean.

The majority of depicted plants are thought to have grown on the island of Thera, although a certain category of plants require wetter conditions and, as it has been suggested, they may actually complement natural scenes taken from other parts of the Mediterranean - primarily North Africa. Having said that, phytoliths provide evidence for the local occurrence of some plants that have been considered to be foreign in the Aegean region<sup>51</sup>. More precisely, it has been argued that, judging from the modern dry climate, date-palm trees, papyrus and other sedges did not grow in the Bronze Age Aegean. Without proposing in this paper that all wall-paintings capture scenes of ‘local’ nature, we, nonetheless, believe that detailed analysis of the way plants are depicted in conjunction with recent palaeobotanical data corroborate the notion that painters were having first hand access to the plants and landscapes they were about to illustrate. In consequence, we are able to challenge past preconceptions alluded to in the bibliography by the standardized use of such terms as ‘nilotic’ or ‘exotic’.

The well-known fragment, found in the ‘Porter’s Lodge’, of a male figure in front of a date-palm tree was dubbed an African by Marinatos in the late 60s<sup>52</sup> (Pl. LVIIIb). Preserved in a very fragmentary state, this wall-painting can now be correlated to the recently identified several more aspects of both the East and North wall decoration of that ‘non’ properly excavated area<sup>53</sup>.

- 45 N. ANGELOPOULOU, “Nature Scenes: An Approach to a Symbolic Art,” in SHERRATT ed. (*supra* n. 2) 545-554. See GEORMA - KARNAVA - NIKOLAKOPOULOU in this volume.
- 46 N. MARINATOS, “An offering of saffron to the Minoan Goddess of Nature. The role of the monkey and the importance of saffron,” in T. LINDERS, G. NORDQUIST (eds), *Gifts to the gods. Proceedings of the Uppsala Symposium 1985*, *Boreas* 15 (1987) 123-132.
- 47 I. DOUSKOS, “The crocuses of Santorini,” in *Thera and the Aegean World II. Papers and Proceedings of the Second International Scientific Congress, Santorini, Greece, August 1978* (1980) 141-146.
- 48 SARPAKI (*supra* n. 26) 657-680.
- 49 VLACHOPOULOS (*supra* n. 2) 631-656.
- 50 On the lily, see A. VLACHOPOULOS, “From Vase Painting to Wall Painting: The Lilies Jug from Akrotiri, Thera,” in R. KOEHL (ed.), *AMIAAA. The Quest for Excellence. Studies in Honor of Guenter Kopcke* (2013) 55-75. The lily and crocus flowers motifs are to be found together on a small soft stone mould from Akrotiri: Σ. ΜΑΡΙΝΑΤΟΣ, “Ανασκαφαί Θήρας II,” *Πρακτικά* 1968, 121-122 pl. 118e.
- 51 O. RACKHAM, “The flora and vegetation of Thera and Crete before and after the great eruption”, in *Thera and the Aegean World I. Papers presented at the Second International Scientific Congress, Santorini, Greece, August 1978* (1978) 755-764.
- 52 S. MARINATOS, “An African in Thera?” *AAA* 2 (1969) 374-375. See *contra* N. MARINATOS, “The ‘African’ of Thera Reconsidered,” *OpAth* 17 (1988) 137-141..
- 53 A. VLACHOPOULOS, “*Disiecta Membra*: The Wall Paintings from the ‘Porter’s Lodge’ at Akrotiri, Thera,” in M. NELSON, H. WILLIAMS, P. BETANCOURT (eds), *Krinoi kai Limenai. Studies in Honor of Joseph and*

The initial interpretation was based on the assumption that a dark skinned male figure and a palm tree ‘must’ have been of ‘North African’ origin. A rather controversial interpretation insofar as all male figures depicted on the Akrotiri wall-paintings are dark skinned<sup>54</sup>, even more so as we now have got evidence for palm phytoliths from several different locations throughout the Bronze Age landscape. Indeed, on the north wall of the ‘Porter’s Lodge’ appear characteristic architectural features such as columns resembling palm trees that support the façade of a building topped with horns of consecration<sup>55</sup>. The ‘exotic’ character of this wall-painting is enhanced by the presence of blue monkeys and a seated(?) female figure set in an otherwise clearly ‘Theran’ rocky landscape<sup>56</sup>.

Wild palm has been identified as growing on the eroded Bronze Age ground surface at the top of the volcanic cone of Mavro Vouno, in the north part of the island while it is evident in several other locations of the modern island. Of no lesser importance is the possibility that the lease trunk of the tree that was supporting the second floor of Xeste 4 (a plaster cast of which was taken during the 2000 excavation) might have originally been a palm tree trunk<sup>57</sup>.

As it has already been mentioned, the plants and river depicted on the east wall of the Miniature Frieze from the West House, right from the beginning, have been referred to as ‘Nilotic’ or ‘subtropical’<sup>58</sup>. It has been plausibly suggested that such a landscape could have existed in the Aegean<sup>59</sup> and what is interpreted as a river could in fact be a torrent. Such seasonal streams have been located in the topography of the Bronze Age landscape and some of them constitute localities where modern streams flow through and follow the pre-eruption morphology. This is further supported by the presence of several diatoms in the palaeosol and identification of depressions in the topography.

Ever since its discovery, the Miniature Frieze has formed the canvas for extensive discussions and interpretations where, depending on the scholar, specific culturally distinct population groups and locales would be identified<sup>60</sup>. It is certainly obvious that both Town IV and V display characteristic landscape features, reciprocated in other scenes, and, therefore, it could be argued that they are depicting Thera. Town IV, on the other hand, surrounded by a large river frequented by fauna (lions, deer et.c.), would presuppose the existence of a landscape with richer vegetation. Most scholars agree that City V (Pl. LIXa), where the entire populace welcomes the fleet, is, indeed, Akrotiri<sup>61</sup>. More reluctant would be a similar characterization with regard to City V, although the results of recent excavations strongly indicate that in this case, too, the city in question is Akrotiri. Indeed, as C. Doumas has noted, both the terrain of the settlement, which extended across a low promontory, and the second bay on the seafront of the city have been identified with actual landmarks<sup>62</sup>.

Quite interestingly, the area stretching to the left of the boats entering the harbor is highly reminiscent of the colourful rock formations exposed from the Akrotiri Light House (Pl. LIXb) down to the Red Beach (Pl. LIXc). There are obviously aspects of proportion and scale involved regarding the rock formations, as they appear to be too small in relation to the focal point of the composition, the town of arrival. It is believed that the artist is creating a sense by selecting what is remarkable about the local landscape. In addition, the three buildings

---

*Maria Shaw* (2007) 127-134 pl. 15.1-19.

54 VLACHOPOULOS (*supra* n. 53) 131-132 pl. 15.2, 15.5, 15.18. Previous bibliography is fully commented upon in this article.

55 VLACHOPOULOS (*supra*) 130-131 pl. 15.4.

56 VLACHOPOULOS (*supra*) 128-131 pl. 15.1, 15.3, 15.4.

57 X. NTOYMAS, “Ανασκαφή Ακρωτηρίου Θήρας,” *Πρακτικά* 1999, 175-176 πίν. 111-112.

58 *Supra* n. 8.

59 P. WARREN, “The Miniature Frieze from the West House at Akrotiri, Thera and its Aegean setting,” *JHS* 99 (1979) 121-129.

60 WARREN (*supra* n. 59) 115-129; DAVIS (*supra* n. 8) 3-14; VLACHOPOULOS (*supra* n. 40) 107; VLACHOPOULOS (*supra* n. 6).

61 C. DOUMAS, *Thera. Pompei of the ancient Aegean* (1983) 55-56; DOUMAS (*supra* n. 40) 49; ΤΕΛΕΒΑΝΤΟΥ (*supra* n. 8) 335-337, 349; VLACHOPOULOS (*supra* n. 6).

62 C. DOUMAS, *The Early History of the Aegean in the Light of the Recent Finds from Akrotiri, Thera* (2008) 22 fig. 22; Doumas in this volume.



overlooking the main town could be those identified on Kokkino Vouno (Vlachopoulos<sup>63</sup>) or at Archangelos, further in the west (Zorzos), where several building remains are visible on the ground surface<sup>64</sup>.

Finally, when inspecting the area that extends immediately east of the Red Beach (Pl. LXa), one discerns several triangular traits that correspond to caves covered under the Late Cycladic eruption layers. This observation solves perhaps the mystery of those features in the frieze that recall ‘pigeon-holes’ (Pl. LXb). Of course, it remains to be seen if this is the case through a more systematic and closer examination of the area.

### Xeste 3: A Painted ‘Biotope’

In Xeste 3 there are at least 15 spaces, allocated in the ground and the two upper floors of the building, the walls of which are adorned with wall-paintings (rooms, sections of rooms, communal areas, corridors and staircases) depicting humans and animals in three types of natural settings<sup>65</sup>.

The first type is that of ‘Theran’ landscape with colourful rocks, hills and craggy terrain, where crocuses bloom in an autumn meadow (north wall of the ‘adyton’ on the ground floor, Potnia and crocus gatherers on the first floor, swallows and monkeys also on the first floor<sup>66</sup>). A variation of this setting appears in the form of colourful mountains along the main staircase, where miniature trees and shrubs grow<sup>67</sup>.

In the second type of environment, that of an ‘aquatic’ landscape, the element of water (river or marsh) prevails and dense growth of plants as well as animals (reeds, ducks and dragonflies) feature in this wetland habitat (Room 3b of the first floor<sup>68</sup>). A similar landscape is also depicted along with the blossoming osiers from Room 9<sup>69</sup>.

The third category of space is the white backdrop on which move life size human figures –both male (pairs of male hunters in the vestibule / room 5 and naked boys in room 3a of the ground floor) and female (the five women in procession)<sup>70</sup>. In this case, then, large-scale figures dominate the ‘space’, while the also present wild animals (bull and ibex) are deprived of their natural setting, possibly because, in this instance, it was not considered to be indispensable. The artist’s priority on those panels was to emphasize the male ‘labour’ of men imposing themselves on the wild power of nature.

63 VLACHOPOULOS (*supra* n. 6); ΒΛΑΧΟΠΟΥΛΟΣ (*supra* n. 7). Recent geophysical prospection on the Kokkino Vouno plateau co-organized by the Akrotiri Excavation and the Boltzmann Institute for Archaeological Prospection (Vienna) showed that on all the three sides (South, East and North) around the trench of S. MARINATOS (*supra* n. 19) a minimum of three buildings are “evident” at low depth underneath the pre-eruption palaeosol. We wish to thank Dr. I. Trinks and Prof. G. Tsokas for this information.

64 Α. ΠΑΠΑΔΟΠΟΥΛΟΣ, “Αρχάγγελος. Μία σημαντική θέση στη νοτιοδυτική Θήρα,” *Αλς* 6 (2008) 89-94.

65 VLACHOPOULOS 2008, 2010 (*supra* n. 40). The second floor of this building was entirely decorated with colorful geometric motifs (spirals, rosettes and lozenges), an “an iconic world” that is left out of the present consideration of the “figural iconography” of Xeste 3. See, A. VLACHOPOULOS, “Conservation and Restoration of Wall Paintings from Xeste 3, Akrotiri, Thera,” in M. ALVANOU (ed.), *Insular Identities* (2013) 90-91 figs 1-3.

66 VLACHOPOULOS 2008 (*supra* n. 40) 451-453 figs 41.19-21.

67 VLACHOPOULOS 2008 (*supra* n. 40) 452-453 figs 41.12-14.

68 ΒΛΑΧΟΠΟΥΛΟΣ (*supra* n. 1) 265-290; VLACHOPOULOS (*supra* n. 2); VLACHOPOULOS 2008 (*supra* n. 40) 453 figs 41.22-32. A similar (riverine) landscape is the natural setting of the Blue Monkeys compositions from room 7 of Building B, where thickets of dense reeds were also depicted. ΦΡ. ΓΕΩΡΓΙΑ, *Οι τοιχογραφίες από το Κτήριο Β του προϊστορικού οικισμού Ακρωτηρίου Θήρας* (αδημ. Διδ. Διατριβή, Πανεπιστήμιο Ιωαννίνων, 2010), v.i, 230-231, v. ii, 78 no 79. Murals with dense bichrome reeds decorated at least two more buildings at Akrotiri, Xeste 4 and a new building in the NW area of the excavated settlement. Α. ΒΛΑΧΟΠΟΥΛΟΣ, “Η διασπορά των τοιχογραφιών στον οικισμό του Ακρωτηρίου Θήρας. Τα δεδομένα μετά από τις πρόσφατες ανασκαφές,” in ΝΤΟΥΜΑΣ ed. (*supra* n. 32, forthcoming).

69 VLACHOPOULOS 2008 (*supra* n. 40) 454 figs 41.41-42.

70 VLACHOPOULOS 2008 (*supra* n. 40) 451 figs 41.3-6; VLACHOPOULOS 2010 (*supra* n. 40) 177-178, 181 fig. 6b; X. ΝΤΟΥΜΑΣ, “Οι εργασίες στο Ακρωτήρι κατά τα έτη 2009 και 2010,” *Αλς* 7 (2009) 2010, 9-13 εικ. 8, 12; Ε. ΠΑΠΑΓΕΩΡΓΙΟΥ, “Κυνηγοί στο Αιγαίο της 2ης χιλιετίας π.Χ. Προεισαγωγικές παρατηρήσεις με αφορμή δύο τοιχογραφίες από τον προθάλαμο της Ξεστής 3,” in ΝΤΟΥΜΑΣ ed. (*supra* n. 21); Ε. ΠΑΠΑΓΕΩΡΓΙΟΥ, “The Iconographic Subject of the Hunt in the 2<sup>nd</sup> Millennium BC Aegean. Sounds and echoes in the art of wall-painting and of vase-painting,” in VLACHOPOULOS ed. (*supra* n. 4).

The five women of the procession on the first floor level -four along the corridor and one on the opposite wall-, carrying flowers and wearing elaborately ornate garments, in some tangible but also metaphysical sense bear the landscape upon themselves. This is especially evident in the female with the rocky landscape down her skirt, where swallows flirt in pairs, and in the female preceding her with the small blue with red heads birds trapped in her lattice bodice<sup>71</sup> (Pl. LXI). In addition, the fifth lady is wearing a bodice the polychrome bordering contour of which displays 'real' flying fish swimming in a colourful rocky seabed. A wild rose and a fruited olive branch adorn her snood<sup>72</sup> (Pl. LXIIa-b). Through the sea-life motifs that 'enliven' her costume, the latter figure seems to conclude the 'kaleidoscopic / holistic' rendering of Physis in this space of 'female imagery of sublime beauty', at the same time, marking out the spot where those who were entering room 3a through the service staircase had to turn left in order to face the Great Goddess.

All of the five female figures in a procession towards the Potnia (Pl. LXIII) deserve careful examination and well thought out interpretation<sup>73</sup>, since their garments (and, to a lesser extent, their snoods) are not simply embellished with motifs that imitate or repeat natural traits in certain decorative arrangements. More accurately conceptualized as 'nature scene costumes', they seem to have been worn more as an emphatic projection of 'real life images' with strong symbolic meaning within the iconographic and ritual milieu of Xeste 3 than as garments of exquisite luxury<sup>74</sup>. It may well be that the emphasis put on individual flora and fauna species (crocuses, lilies, roses, olive tree, flying fish, swallows) manifests the wish of the community to state distinct versions of the 'Mother Goddess', in which case the life-size ladies in procession (Pl. LXIV) embody some of the multi-dimensional aspects (hypostases) of the supreme female Aegean Divinity<sup>75</sup>, who is here depicted in her archetypical image, as seated Potnia, on the north wall of the same space.

Seated literally in the centre of this space and rendered at a slightly bigger scale the majestic Potnia outshines the female crocus gatherers who occupy the east and north walls of room 3a (Pl. LXV). She is sitting on a three-stepped platform and behind her evolves a landscape of 'flying crocuses' spaced symmetrically as well as asymmetrically on the white background that eventually turns into hybrid grassland<sup>76</sup>. To the left of the Potnia, behind the

71 A. ΒΛΑΧΟΠΟΥΛΟΣ, "Βίρα-Μάινά: Το χρονικό της συντήρησης μίας τοιχογραφίας από την Ξεστή 3 του Ακρωτηρίου," in A. ΒΛΑΧΟΠΟΥΛΟΣ - Κ. ΜΠΙΡΤΑΧΑ (eds), *ΑΡΓΟΝΑΥΤΗΣ. Τιμητικός Τόμος για τον καθηγητή Χρίστο Ντούμα από τους μαθητές του στο Πανεπιστήμιο Αθηνών* (2003) 505-526 figs 20-23; VLACHOPOULOS 2007 (*supra* n. 40), 114 pl. XXXa-b; VLACHOPOULOS 2010 (*supra* n. 40), 183 fig. 12a-b; VLACHOPOULOS - GEORMA (*supra* n. 40), 38 pl. XV-XVI.

72 *Supra* n. 40. Also see, U. GÜNDEL-MASCHEK, "Reflections on the Symbolic Meaning of the Olive Branch as Head-Ornament in the Wall Paintings of Building Xeste 3, Akrotiri," in NOSCH - LAFFINEUR eds (*supra* n. 40) 361-367.

73 On some of the qualities of these garments in early Greek poetry, see VLACHOPOULOS 2007 (*supra* n. 40) 114-115, pl. XXX, XXXI.

74 For a detailed commentary and interpretation of the garments of the "Ladies in Procession", see A. VLACHOPOULOS, "Dressed in Textiles or dressed in Nature?. The Patterned Textiles of the Xeste 3 Female Figures," in M. SHAW - A. CHAPIN (eds), *Patterned Textiles of the Aegean Bronze Age, with contributions by Elizabeth Barber, Brendan Burke, Suzanne Murray, and Andreas Vlachopoulos, Danish National Research Foundation's Centre for Textile Research* (forthcoming). Also see: P. REHAK, "The Aegean Landscape and the Body: A New Interpretation of the Thera Frescoes," in N.L. WICKER - B. ARNOLD (eds), *From the Ground Up: Beyond Gender Theory in Archaeology. Proceedings of the Fifth Gender and Archaeology Conference, University of Wisconsin-Milwaukee, October 1998* (1999) 11-22; P. REHAK, "Crocus costumes in Aegean art," in A. CHAPIN (ed.), *XARIS. Essays in Honor of Sara A. Immerwahr* (2004) 85-100; A. CHAPIN, "Maidenhood and Marriage: The Reproductive Lives of the Girls and Women from Xeste 3, Thera," *Aegean Archaeology* 4 (1997-2000) 7-25. Earlier opinions (VLACHOPOULOS 2010, *supra* n. 40, 183 fig. 12a-b) that these female figures are members of the elite clans of the Thera society who symbolically lead the young girls to be initiated into the space where the Great Goddess will be viewed needs reconsideration, since the functional role of this narrow corridor (connecting the first floor with the spacious upper floor) has appeared much more important for the understanding of both the architecture and the iconography of Xeste 3. See, VLACHOPOULOS 2010 (*supra* n. 40) 183, 184 fig. 12a-b, 15, 16.

75 On the interpretation of these floral motifs, see VLACHOPOULOS 2010 (*supra* n. 40) 183.

76 DOUMAS (*supra* n. 40) 130-131 figs 122-128; VLACHOPOULOS 2008 (*supra* n. 40) 453 figs 41.19-21; VLACHOPOULOS 2010 (*supra* n. 40) 180-184 fig. 11; VLACHOPOULOS 2010 (*supra* n. 40) 182 fig. 9, 11.

window, we see the main scene of crocus collection in which three female figures are gathering and then carrying crocuses, positioned in the rocky crocus-bearing landscape depending on the task each one of them is performing.

It is uncertain what this environment is and what is the context of the landscape: is it a Theran one, Minoan, hybrid, an ideal or idealized one<sup>77</sup>, imaginary or real?

The Potnia, a splendidly bejewelled and dressed mature female figure, receives by the crocus gatherers the end product of the harvest (dry crocus stamens) and appears very approachable to the eyes of the blue monkey and the little crocus gatherer who are ecstatically gazing at her. Her costume and jewellery highlight symbolic aspects of the natural world that surrounds her: crocus on her dress, an actual crocus on her face, embroidered crocuses on her bodice, belt and skirt, and necklaces depicting ducks and dragonflies. Nature is distinctly evident and represented with several symbols that are drawn from the landscape that surround it, while the presence of the winged griffin stresses the supernatural hypostasis of the divinity<sup>78</sup>.

To the right of the wall depicting the Potnia, on the west and south wall of Room 3b and on smaller surfaces (Pl. LXVI), we come across a third type of natural setting, the Reed marsh, where ducks and dragonflies fly around or above the tufted reeds<sup>79</sup>. This specific marshy landscape, that here unfolds in its complete form, would have been encountered in quite a few different spots of the Theran scenery, as indicated by the identification of several phytoliths from reeds both in the physical landscape and within the settlement of Akrotiri, on basketry.

What is being emphasized in the Reed wall-paintings then is that aspect of seasonality which is very prominent in the Akrotiri murals<sup>80</sup>, captured, indeed, on the blossoming red lilies of the Spring Fresco as well as on various wall-paintings depicting crocuses that are usually ready to be collected after the first rainfalls of November. On Thera, nowadays, one can witness the change that autumn brings with it every September when suddenly the inflorescences of reed make their first appearance, standing in striking contrast to their rather bare look during the preceding summer months. *Arundo Donax* reed phytoliths are evident both within the settlement of Akrotiri as well as in several locations in the landscape. There is evidence for use of reeds as a canvas layer applied behind the mural plaster on the walls of Akrotiri while it was also widely used for basketry, matting and felts.

On the north wall of room 3, on the ground floor, the three females ('adorants') represented on it are separated by their gestures and the intervening between them physical space, since only the seated Wounded Lady is directly linked to the rocky landscape with crocuses<sup>81</sup>. We can perhaps infer that this is the entrance to a cave as there are rocks in the upper section of the wall-painting<sup>82</sup>. Nevertheless, the ruling iconographic axis dictating the rendering of this figure is the bent stem of a crocus flower, on top of which the suffering female is stepping her bleeding foot, a clear innuendo to the healing-haemostatic properties of the plant<sup>83</sup>.

The natural scenery of the iconography discussed thus far, as well as other wall-paintings found on the same and the upper floors at Xeste 3 (monkeys imitating human fencing<sup>84</sup>, swallows feeding their young ones with dragonflies and worms<sup>85</sup>) can be considered as depicting the Theran landscape. How should we then interpret the wall-painting that is currently being reconstructed and depicts a landscape, identified in Room 2 most likely opposite the blue monkeys?

77 VLACHOPOULOS - GEORMA (*supra* n. 40), 40.

78 N. MARINATOS, *Art and Religion in Thera* (1984) 68, 70, 84 fig. 49; DOUMAS (*supra* n. 40) 131; VLACHOPOULOS 2010 (*supra* n. 40) 180, 183, 184, 185 fig. 11.

79 ΒΛΑΧΟΠΟΥΛΟΣ (*supra* n. 1) 261-286; VLACHOPOULOS (*supra* n. 2).

80 MARINATOS (*supra* n. 78) 68, 71 fig. 44; ΒΛΑΧΟΠΟΥΛΟΣ (*supra* n. 1), 281.

81 DOUMAS (*supra* n. 40) 128-129 figs 100-109; VLACHOPOULOS - GEORMA (*supra* n. 40) pl. XVII.d.

82 VLACHOPOULOS 2007 (*supra* n. 40) 112 pl. XXVIIIb.

83 On the curative properties of the crocus stamens (saffron), see S.C. FERRENCE - G. BENDERSKY, "Therapy with Saffron and the Goddess at Thera," *Perspectives in Biology and Medicine* 47.2 (2004) 199-226. On the iconography of the crocus and the properties of saffron, see J. DAY, "A Diachronic Survey of the Crocus Motif in the Aegean Bronze Age," *Hesperia* 80 (2011) 337-379, especially n. 7.

84 DOUMAS (*supra* n. 40) 128 figs 95-96; VLACHOPOULOS 2008 (*supra* n. 40) 453 figs 41.17-18.

85 VLACHOPOULOS 2008 (*supra* n. 40) 453 figs 41.15-16; VLACHOPOULOS 2010 (*supra* n. 40) 183, 190 fig. 13.

According to what has originally been discussed above, this dense landscape filled with parallel palm trees, with arching branches, amongst circular rocks and with growing reeds, while two (or even three) startled ducks along with dragonflies fly on the same level, can be attributed to what is stereotypically known as a 'Nilotic landscape' of Aegean art. This view is highlighted further in the epicentre of the scene where what is most likely a cow seems to nurse her calf<sup>86</sup> (Pl. LXVIIa). The wall-painting has a number of sections missing, but despite its fragmented state displays several features paralleled in contemporary related iconography<sup>87</sup>.

The vegetation and land depression portrayed here are almost as if they have been taken directly from the Bronze Age landscape. Palms and reeds have been identified together in several pre-eruption locations along while depressions in the landscape are also evident. The importance of the palm tree is not apparent just in iconography. We have evidence for palm leaves being used for fine ropes and basketry at Akrotiri as well as a roof feature made of similar raw material found in the excavations at Raos<sup>88</sup>. Another highly intriguing aspect is the evidence that palm leaves were used as guidelines in the drawing process of the Palm Trees wall-painting in Room 2 (Pl. LXVIIb). The leaves have been pressed onto the plaster and then painted over as it can be seen in the above quoted figure. The use of a palm leaf as a guide in the mural seems highly logical considering the painting is to scale. All this adds a new dimension to the Thera fresco painting and it even raises the question whether it is possible to assume that plants may have been used as additional elements in iconographic representations.

Xeste 3 encompasses the Thera landscape in its iconography, while at the same time highlighting its didactic role towards the Thera youth, particularly during the performance of their initiation rituals, which most likely used to house<sup>89</sup>. The plants that are depicted as growing from the ground are offered as bouquets, adorn clothing and snoods, and work as actual, imaginary or portable 'landscapes' originating from the Thera flora<sup>90</sup>. They do not appear as a theme of 'Minoan floral hybridism' being derived from a reservoir of 'religious art' but present the dynamic and targeted reproduction of the physical space in which the recipients receive this imagery of private or public, ceremonial-ritual and religious eikones<sup>91</sup>.

The Thera wall-paintings were meaningful for the local inhabitants and this is evident by the themes selected as well as the sheer number of depicted scenes. The murals in one sense can be seen to replace, physically or metaphysically, the natural setting within the urban landscape of the town. When the island's habitat is depicted, this is done with accuracy and liveliness, aiming to emphasize its vital role in the shaping of the community's *sympan*, a 'universe' in which the actual landscape seems to shelter most of the cosmological, religious and rituals beliefs of the Therans.

86 The "Palm-trees wall painting" had been illustrated in an initial step of its restoration in VLACHOPOULOS 2008 (*supra* n. 40) 451 figs 41.7-9. The animal's body, depicted in monochrome yellow and with red fringed outline, being very badly preserved, had been interpreted as a lion attacking a small goat. The recent reassembling of the wall painting leaves little doubt for misinterpretations of the animal, even if there are still a lot of inconsistencies to be surpassed, mostly due to the extensive flaking of all the mural's pigments.

87 CMS II.3, 88, 288, 389. On this subject see: PM IV, 552- 558 figs 512-515. Cf. the faience plaques from the Temple Repositories of Knossos with cow and ibex suckling their young: PM I, 510 seqq figs 366, 367, 369.

88 The extensive use of palm leaves for making various artefacts at Akrotiri is striking particularly as it was first discovered in the pre-eruption landscape. Subsequently more than 70 samples have been extracted from various Akrotiri excavation contexts as well as fragments of objects such as ropes, baskets, felt and matting that are being studied in order to determine the exact plant material used for their manufacture (L. Zorzos Ph.D. Thesis, forthcoming). L. Zorzos would like to thank Dr. M. Marthari for inviting him to sample and study soil samples for phytoliths at the excavation of Raos (see MARTHARI 2004 *supra* n. 20).

89 E. DAVIS, "Youth and Age in the Thera Frescoes," *AJA* 90 (1986) 399-406; REHAK 1999, 2004 (*supra* n. 74); C. DOUMAS, "Age and Gender in the Thera Wall Paintings," in SHERRATT ed. (*supra* n. 2) 971-980; CHAPIN (*supra* n. 74); U. GÜNKEL-MASCHEK, "'Verwundet' und 'verhüllt' Vom Mädchen zur Frau in den Darstellungen aus Xesté 3," in M. MEYER - V. GASSNER (eds), *Standortbestimmung. Akten des 12. Österreichischen Archäologentages vom 28.2 bis 1.3.2008 in Wien* (2010) 11-18; VLACHOPOULOS 2010 (*supra* n. 40).

90 ΒΛΑΧΟΠΟΥΛΟΣ (*supra* n. 1) 279-282.

91 VLACHOPOULOS 2010 (*supra* n. 40) 182-184, 189-190 fig. 16.

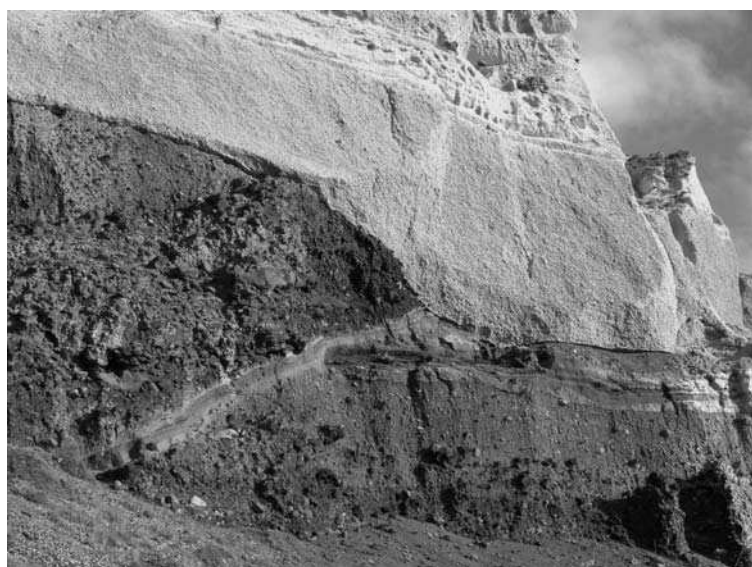
The new evidence presented here challenges some of the preconceptions that we have about the Late Cycladic Thera landscape. The results indicate that there has been a significant change in the climate and environment of Thera between the time before the eruption and today; the wall paintings of Akrotiri bear trustful witness in support of this assumption.

Andreas VLACHOPOULOS  
Lefteris ZORZOS

## LIST OF ILLUSTRATIONS

- Pl. LVIa Slopping palaeosol layers blanketed by the first phase of the Bronze Age eruption at the Karageorghis quarry.
- Pl. LVIb Akrotiri, Thera. Plaster cast of a tree that was found still standing north of Xeste 4. Akrotiri Excavation Storeroom.
- Pl. LVIc GIS dem indicating main locations where Late Cycladic paleosol exposures have been recorded and sampled by L. Zorzos.
- Pl. LVId Sampling and recording of the interface between the pumice and Late Cycladic landscape (Vlichada).
- Pl. LVIIa Sedge multi-cell phytolith with cone from Akrotiri felt.
- Pl. LVIIb Dicot leaf Polyhedron from the Mavromatis quarry in Megalochori.
- Pl. LVIIc Indentation in the Bronze age land surface at the Fira quarry where a large number of diatoms, sedges and reed grass bulliforms have been identified.
- Pl. LVIIId Mavromatis quarry indicating the location of the Late Cycladic farmstead (A) and the location of the phytolith samples and identified wheat field.
- Pl. LVIIIa Wheat husk multi-cell from a Mavromatis quarry phytolith sample.
- Pl. LVIIIb Akrotiri. The male figure ('African') from the Thyroreion (Porter's Lodge). Drawing by M. Kriga.
- Pl. LIXa Akrotiri, West House. The 'Arrival Town V'. Museum of Prehistoric Thera. Photo: Geert Verhoeven.
- Pl. LIXb Colourful rock formations in the Akrotiri lighthouse area.
- Pl. LIXc Red Beach from above. The triangular caves are located on the left.
- Pl. LXa Triangular caves in the area west of the Red Beach.
- Pl. LXb Triangular cave up close.
- Pl. LXI Akrotiri, Xeste 3. The two 'Women in procession' along the corridor (south wall) leading to room 3. Drawing: Maria Kriga.
- Pl. LXIIa-b The 'Fifth Woman' opposite the corridor leading from the service staircase to room 3. Akrotiri Excavation, Laboratory of the Wall-Paintings. Photo : Nikos Sepetzoglou, drawing: Maria Kriga.
- Pl. LXIII Xeste 3. Digital drawing of room 3 (Nikos Sepetzoglou). North wall: Potnia, East wall: Crocus gatherers, West wall: Reeds. The 'Ladies in Procession' cover the walls of the corridor depicted in two pairs; the 'Fifth Lady' is on the wall opposite them.
- Pl. LXIV Xeste 3, the corridor leading from the service staircase of the building to room 3. Digital drawing (Nikos Sepetzoglou) of the five 'Ladies in Procession'.
- Pl. LXV Xeste 3. Digital drawing of room 3 (Nikos Sepetzoglou). North wall: Potnia, East wall: Crocus gatherers, West wall: Reeds.
- Pl. LXVI Xeste 3, room 3. Digital reconstruction (Nikos Sepetzoglou) of room 3b, West and South walls.
- Pl. LXVIIa Xeste 3, room 2. Digital drawing (Nikos Sepetzoglou) of the 'palm trees wall-painting'.
- Pl. LXVIIb Actual leaf impressions on the Palm trees fresco from Room 2. Photo: Antonis Eleftherakis.

Copyright of photographs and drawings: Akrotiri Excavation, The Archaeological Society of Athens.



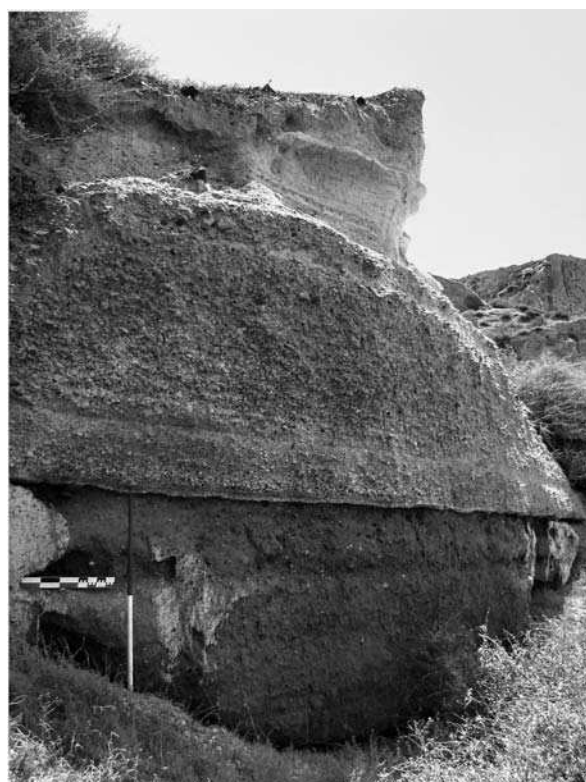
a



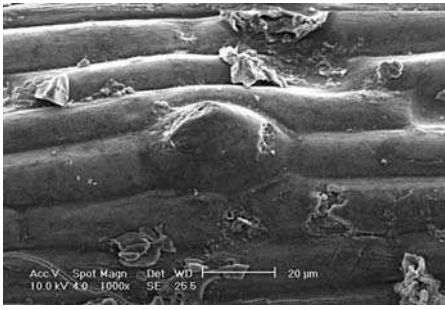
b



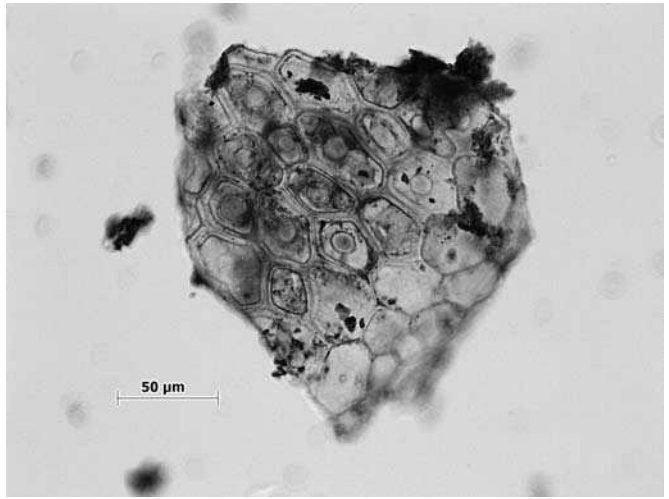
c



d



a



b

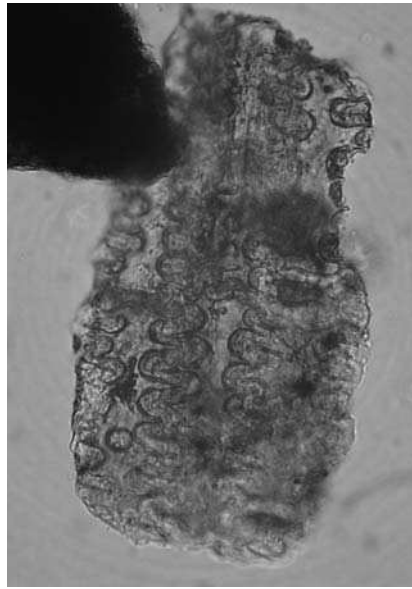


c



d





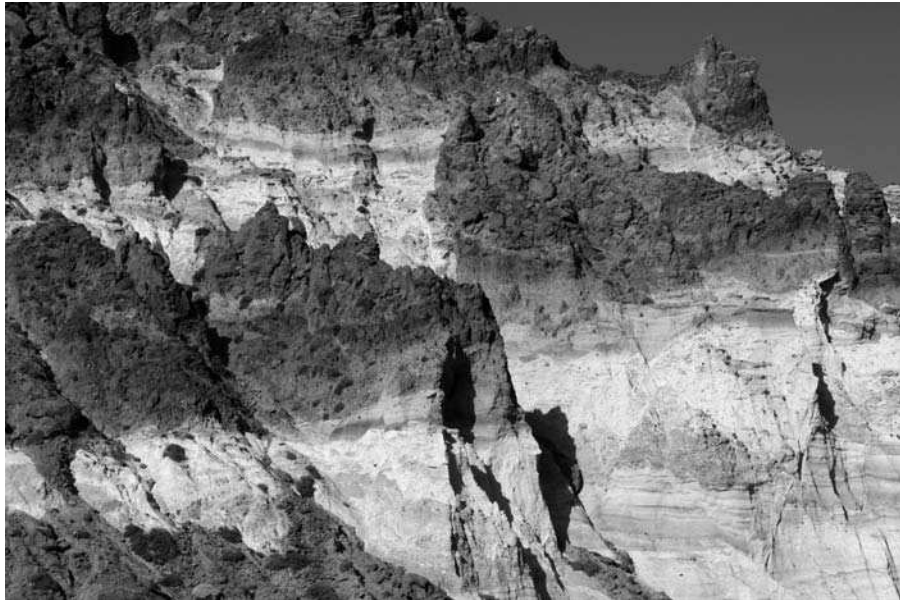
a



b



a



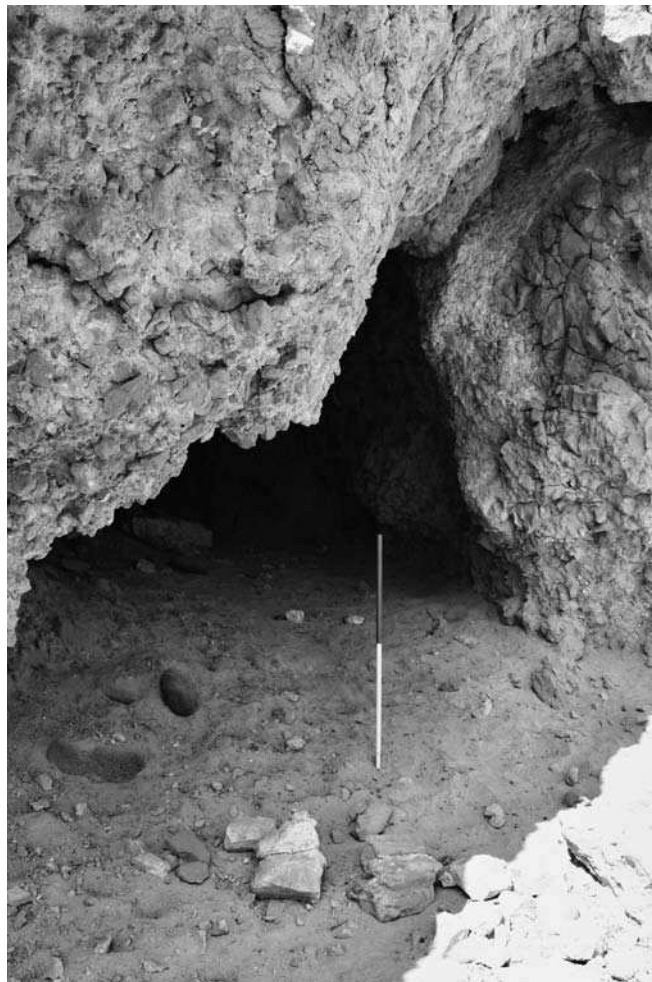
b



c

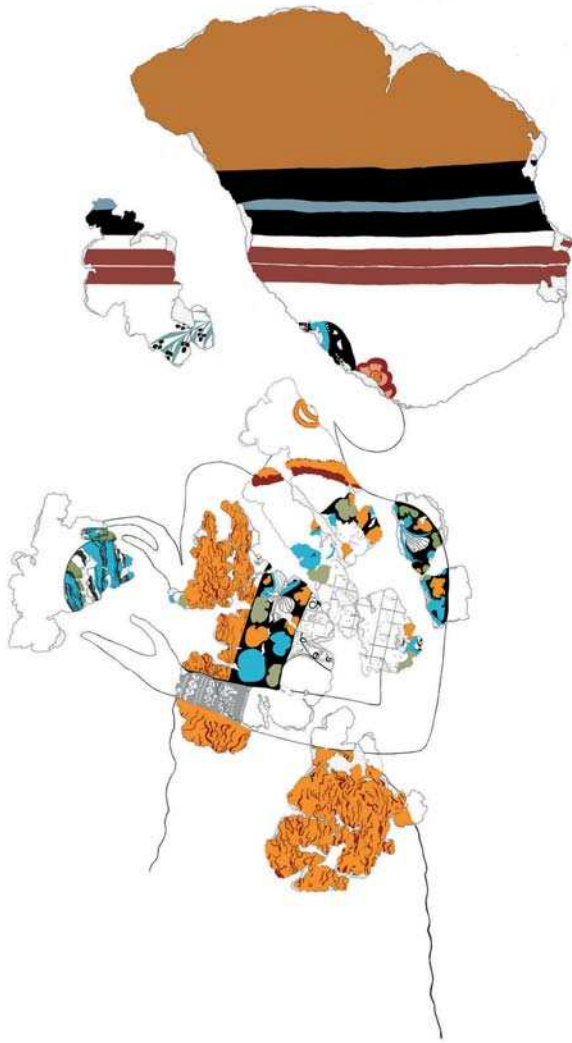


a

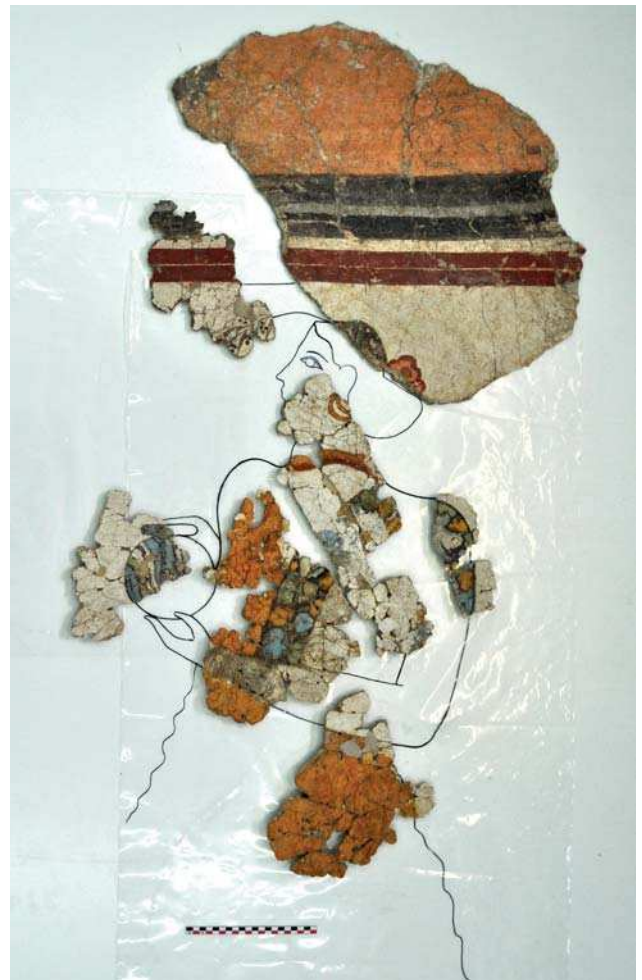


b



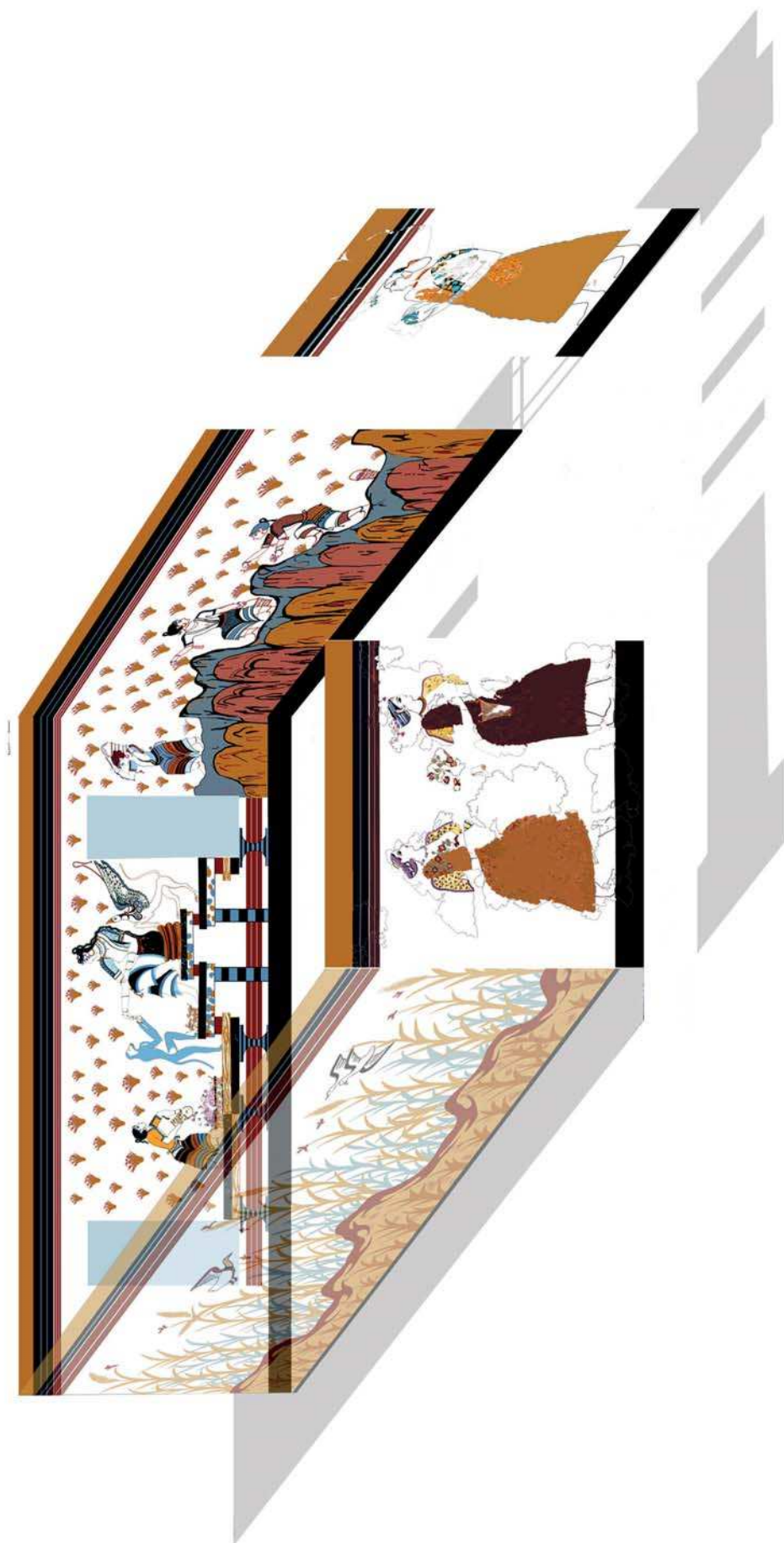


a

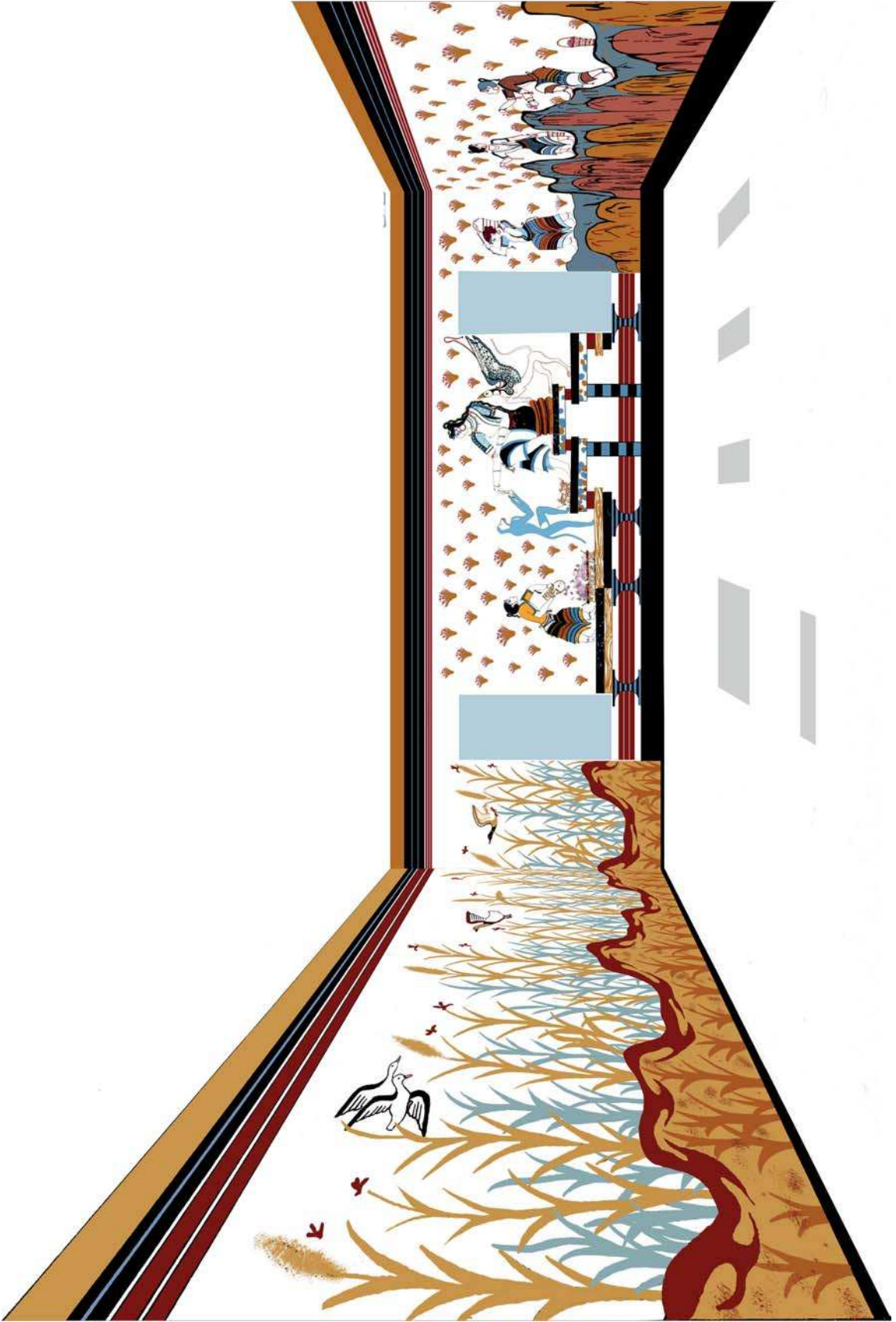


b

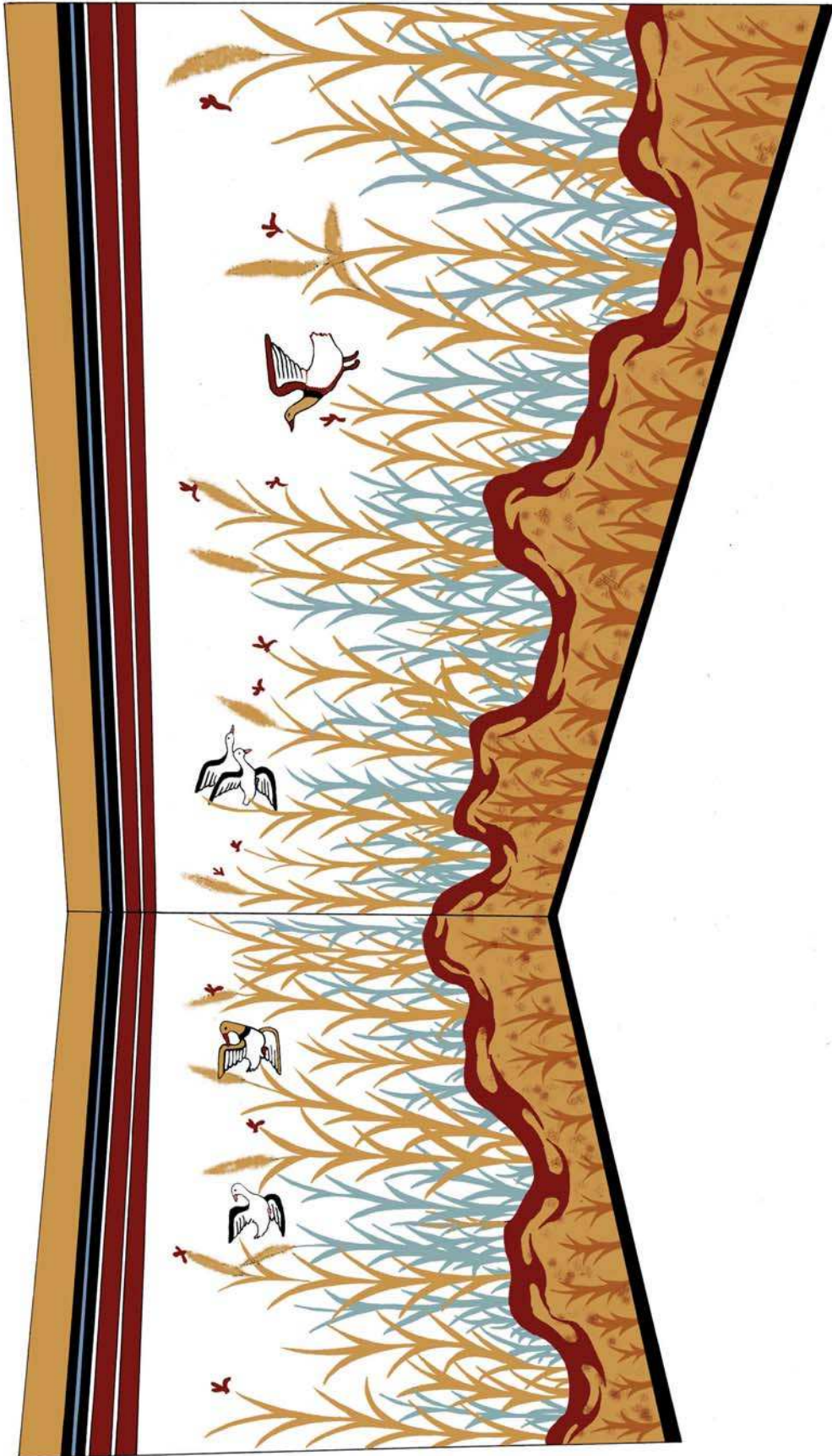














a



b