



Επιστημονικό Σωματείο,  
Έτος Ίδρυσης 1982, έδρα:  
Κάνιγγος 27, 106 82 Αθήνα  
(Ένωση Ελλήνων Χημικών)

**ΔΙΟΙΚΗΤΙΚΟ  
ΣΥΜΒΟΥΛΙΟ:**

N. Ζαχαριάς, (πρόεδρος), N.  
Κυπαρίσση (αντιπρόεδρος),  
M. Γεωργακοπούλου  
(γραμματέας), Θ. Βάκουλης  
(ταμίας), Γ. Μπασιάκος  
(μέλος), Κ. Πολυκρέτη  
(μέλος), Γ. Φακορέλλης  
(μέλος)

**Πληροφορίες:**

Γ. Φακορέλλης

**E-mail:** [facorel@ha.uth.gr](mailto:facorel@ha.uth.gr)

Scientific Association, Year  
of Establishment 1982,  
Headquarters: Kaniggos 27,  
106 82 Athens (Association  
of Greek Chemists)

**BOARD:** N. Zacharias  
(president), N. Kyparissi  
(vice-president), M.  
Georgakopoulou (secretary),  
T. Vakoulis (treasurer), I.  
Bassiakos (member), K.  
Polikreti (member), Y.  
Facorellis (member)

**Information:** Y. Facorellis

**E-mail:** [facorel@ha.uth.gr](mailto:facorel@ha.uth.gr)

# Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

**- Δεκέμβριος 2007 -**

**Be kind, for everyone you meet is fighting a hard battle.**

*Plato*

## Newsletter of the Hellenic Society of Archaeometry

**- December 2007 -**

**Nr. 81**

## ΠΙΝΑΚΑΣ ΠΕΡΙΕΧΟΜΕΝΩΝ – TABLE OF CONTENTS

### ΣΥΝΕΔΡΙΑ – CONFERENCES/WORKSHOPS

INTERNATIONAL ARCHAEOLOGICAL SYMPOSIUM, CYPRUS AND EAST AEGEAN: Intercultural contacts from 3000 to 500 BC, Samos, October 17 <sup>th</sup> – 18 <sup>th</sup> 2008 .....	page 4
Sounds from the Past: Music in the Ancient Near East and Mediterranean Worlds, January 7-8, 2008, Bible Lands Museum Jerusalem, First Conference Announcement .....	page 7
Call for applicants for participation in the course, “Field school on archaeological science”, (For students who are registered in universities outside Israel) .....	page 10
International Congress Villanovaforru (Cagliari-Sardinia-Italy): The Nuragians, the Phoenicians and the others. Sardinia between the final Bronze Age and the Early Iron Age, 14-15 December 2007.....	page 12
Call for Papers and Posters: “What Would a Bronze Age World System Look Like? World-systems approaches to Europe and western Asia 4th to 1st millennia BC”, 1st-4th April 2008, Department of Archaeology, University of Sheffield, UK .....	page 13
ESF EuroCLIMATE Spring School "Late Quaternary Timescales and Chronology", Piran/Slovenia, 20 - 26 April, 2008 .....	page 15
SAfA (Society of Africanist Archaeologists) conference, Frankfurt, September 8-11, 2008 .....	page 17
Summer School in Ancient and Historic Metals: 2008 Held at UCLA: Cotsen Institute of Archaeology Monday 18 <sup>th</sup> August- Saturday 23 <sup>rd</sup> August 2008 .....	page 18
<b><u>ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ – JOB VACANCIES/FELLOWSHIPS</u></b>	
UNIVERSITY OF CINCINNATI, Department of Classics, MARGO TYTUS VISITING SCHOLARS PROGRAM .....	page 21
Kiel University, new Graduate School "Human development in Landscapes", advertisement of 20 doctoral stipends .....	page 23
POSITION AVAILABLE, RHYS CARPENTER FACULTY FELLOW IN CLASSICAL STUDIES, POSITION IN ATHENS .....	page 25
UNIVERSITY OF CINCINNATI, Department of Classics, TYTUS SUMMER RESIDENCY PROGRAM .....	page 26
Fieldwork opportunity at Pylos .....	page 27

Volunteers for Halai, summer 2008 ..... page 28

THE MEDITERRANEAN ARCHAEOLOGICAL TRUST, GRANTS TO  
ASSIST PUBLICATION ..... page 29

**ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS**

Metallurgy in the Early Bronze Age Aegean, edited by Peter M Day and  
Roger C P Doonan ..... page 30

**ΕΙΔΗΣΕΙΣ - NEWS RELEASE**

Team IDs ancient cargo from DNA ..... page 31



## **ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS**

# **INTERNATIONAL ARCHAEOLOGICAL SYMPOSIUM, CYPRUS AND EAST AEGEAN: INTERCULTURAL CONTACTS FROM 3000 TO 500 BC, SAMOS, OCTOBER 17<sup>TH</sup> – 18<sup>TH</sup> 2008**

The A.G. Leventis Foundation and the German Archaeological Institute at Athens are inviting you to attend the INTERNATIONAL ARCHAEOLOGICAL SYMPOSIUM, CYPRUS AND EAST AEGEAN: Intercultural contacts from 3000 to 500 BC, Samos, October 17th – 18th 2008

The cultural contacts between Cyprus and the East Aegean start in the 3rd mill. BC, when the island of copper adapted the know-how of tin bronze from the Southeast and the South coast of Anatolia. The contacts are getting more intensive in the 2nd mill. BC, when Cyprus dominates in the Mediterranean as the most important supplier of copper and welcomes colonists from Mycenaean Greece. This relationship reaches its peak in the Iron Age under the supervision of new political entities, the Cypriot Kingdoms. The contacts between these geographical regions are differentiated through the ages regarding the direction and the purpose, as well as the quality and the quantity.

The Symposium aims to study various aspects of the cultural interaction between Cyprus, Western Anatolia and the East Aegean islands from the Bronze through the Iron Ages (3000-500 BC) based upon the archaeological evidence and the archaeometric analyses. Trade sea-routes, exchange of raw materials and technologies (ceramic, metallurgical, sculpture etc), economic structures, settlement organization, political organization and political schemes, religion and ritual practices, social organization and methods of social demonstration are the main aspects to be discussed in this symposium.

The International Archaeological Symposium will take place on the 17th and 18th October 2008 at Doryssa Bay Hotel-Village, Pythagoreion, Samos. The papers will be held in English and will last 20 minutes. Below you will find the list of the speakers and the titles of the papers. The final programme will be announced soon.

The Symposium does not include any fees. In case you would like to attend it, you are kindly requested to confirm your participation to the Organizing Committee until August 31st 2008 and arrange your accommodation by yourself either at the place the Symposium will be held or elsewhere.

\*\*\*\*\*

FOUNDATION ANASTASIOS G. LEVENTIS  
40, Gladstonos str.  
P.O. Box 2543  
CY - 1095 Nicosia

Tel.: + 357 22 667706  
Fax: + 357 22 675002  
Email: [leventcy@zenon.logos.cy.net](mailto:leventcy@zenon.logos.cy.net)  
DORYSSA BAY HOTEL-VILLAGE  
GR - 831 03 Pythagoreion, Samos Island  
Tel. +30-22730-88300  
Fax. +30-22730-61463  
Email: [doryssa@otenet.gr](mailto:doryssa@otenet.gr)  
<http://www.doryssa-bay.gr>

\*\*\*\*\*

### **Organizing - Scientific Committee**

Vassos Karagiorghis  
Ourania Kouka  
Nota Kourou  
Wolf – Dietrich Niemeier

### **List of speakers**

Vassos Karageorghis Ourania Kouka	Cyprus and the East Aegean: Some Introductory Remarks East Aegean, Western Anatolia and Cyprus: Intercultural Contacts in the 3rd and the First Half of the 2nd Mill. BC
Toula Marketou	Rhodes and Cyprus in the Bronze Age. Old and New Evidence of Contacts and Interactions
Pelelope Mountjoy	Contacts Between the East Aegean and Cyprus as Evidenced by LB III Pottery
Reinhard Jung	Pirates of the Aegean. Italy – East Aegean – Cyprus at the End of the 2nd Millennium BCE
Eleni Farmakidou	How Far Pots Can Go? Conceptualizing Pottery Production and Exchange in Geometric Rhodes
Sigrid Jalkotzy Helmut Kyrieleis	The "Hellenization" of Ionia and Cyprus Intercultural Commerce and Diplomacy: Near Eastern, Egyptian and Cypriot Artefacts From the Heraion of Samos
Nota Kourou	Cypriot art in Eastern Aegean Sanctuaries. Votives and Interaction
Jacqueline Karageorghis	Moulds and Production of Terracotta Figurines in Cyprus and the East Aegean During the Archaic Period
Panayiota Marantidou	The Female Figure in the Archaic Art of Cyprus and Eastern Aegean. A Comparative Study
Vassilis Kilikoglou	Title to be announced
Maria Viglaki	Cypriot Finds at the New Museum at Vathy, Samos
Ergun Lafli	Cypriote Imports to Archaic Northern Ionia
Jan-Marc Henke	The Cypriote Terracottas of Miletus
Reinhard Senff	Beasts, Heroes and Worshippers – Statuettes Made of Cypriote Limestone from the Aphrodite-Sanctuary of Miletus

Antoine Hermary	The Ionian Styles in the Cypriote Sculpture of the Sixth Century BC
Kathrin Kleibl	A New Approach to the Interpretation of Cypriote Kourotrophos Statuettes of the Archaic Period
Ursula Höckmann	Goat Sacrifices for Aphrodite in Cyprus, and for Hera and Athena in East Greece and Naukratis? Assimilation between Cypriote and Greek Gods in the 6th century BC
Sabine Fourier	East Greek and Cypriote Ceramics of the Archaic Period
Constance von Rügen	Eastern Aegean – Cypriote Relations in the 7th and 6th Century BC: A View from the Ceramics
Anna Lemou	Interrelations in the Pottery Production Between Cyprus and Chios in the Archaic Era
Olga Philaniotou	A Late Bronze Age Faience Workshop on Naxos
Dietrich Berges	The East-Dorians and the Levant

\*\*\*\*\*

Ourania Kouka  
Department of History and Archaeology  
Archaeological Research Unit  
University of Cyprus  
P.O.Box 20537  
CY - 1678 Nicosia  
Tel. +357 22 674702 #17  
Fax. +357 22 674101

1, Komotinis str.  
GR- 185 41 Piraeus  
<http://www.ucy.ac.cy/isa/biografika/kouka.htm>

\*\*\*\*\*



# **SOUNDS FROM THE PAST: MUSIC IN THE ANCIENT NEAR EAST AND MEDITERRANEAN WORLDS, JANUARY 7-8, 2008, BIBLE LANDS MUSEUM JERUSALEM**

## **First Conference Announcement**

The Bible Lands Museum Jerusalem, in collaboration with the Department of Musicology and the Jewish Music Research Centre, Hebrew University of Jerusalem, are pleased to announce a conference entitled Sounds from the Past: Music in the Ancient Near East and Mediterranean Worlds to be held in conjunction with the exhibition Sounds of Ancient Music.

The conference will be held at the Bible Lands Museum Jerusalem.

### **Theme**

The conference will examine the formation and function of ancient musical instruments, their sounds and their place and purpose in the lives of the diverse peoples of Mesopotamia, Egypt, Greece and Rome. In the realm of music, the ancient Near East and Mediterranean worlds form a continuum.

Along this continuum ideas and systems moved westward but were reformulated in each unique culture along the path from the plain of Mesopotamia to the shores of the Aegean Sea. In this conference, we hope both to survey the range and gamut of this symbiosis as well as to scrutinize certain specific geographical areas.

Biblical music has been the subject of much scientific research focusing on archaeological testimonies from ancient times and the reconstruction of their original forms. This research has generated lively debate and speculation. We intend to highlight issues regarding biblical musical instruments, such as the shofar.

Another session of the conference will be devoted to the role of music played in temple cults and in the theology of ancient societies. The power to move the human spirit has always been attributed to music and it was thus of considerable importance in the liturgy of the temple service. In every temple in the ancient world, from Sumer to Jerusalem and beyond, communication with the divine was expressed through music, song and dance.

The sacredness of music is exemplified by the deified instruments of the ancient Mesopotamian worship. In the Greek world, the philosophical system built on the music of the spheres, credited to Pythagoras became the foundation on which all cosmological systems were built for the next two thousand years.

### **Conference Program**

Two days of lectures, together with a session of workshops involving reconstructions of ancient instruments and musical composition are planned.

There will also be an optional third day which will include guided tours of the extensive collection of the Bible Lands Museum Jerusalem and other sites. The lectures are to be given by some of the major international scholars in the field of Ancient Musicology, Assyriology and Archaeology.

The first day is dedicated to the Ancient Near East and the reconstruction of the sound of ancient music. The second day will be devoted to the music of the Biblical and Classical worlds.

### **Papers**

If you wish to present a paper, the title and abstract should be sent to [curatorial@blmj.org](mailto:curatorial@blmj.org) to reach us no later than October 31, 2007.

Presentations should be for 20 minutes. There will be an additional 10 minutes for questions after delivery of the paper. Presentations are to be made in English, and papers from the conference will be published.

Upon acceptance of your paper, we will send you a form detailing audio-visual aids and services which are available for your presentation

### **Registration and Payment**

The fees for conference are as follows:

\$65 or 250 NIS

\$50 or 185 NIS (Museum members, students and senior citizens)

The fee includes admission to the museum, lectures and workshops, coffee breaks and a light-lunch on both days. Tours of Jerusalem will be available on Wednesday January 9, at an additional cost.

### **Payment information**

Please make checks or money orders payable to: Bible Lands Museum Jerusalem

Remit payment to: Bible Lands Museum Jerusalem P.O.B. 4670, Jerusalem 91046, Israel

Or, payments may be made via bank transfer: Bible Lands Museum Jerusalem

Account No.: 180580 Sort Code: 11-067 Israel Discount Bank, LTD. 220 Jaffa Street, Jerusalem 94383, Israel

Payment may also be made by credit card. If you choose this payment method, please ensure that you quote credit card no., full name of card holder and expiry date of card.

Registration will take place at the Bible Lands Museum on Sunday January 6 from 16.00-18.30 hours and on Monday January 7 from 09.00-09.30 hours.

### **Location**

The Bible Lands Museum Jerusalem houses one of the world's most exceptional collections of artefacts from the Ancient Near East illustrating the civilizations of the biblical period, including Mesopotamia, Egypt, Phoenicia, Greece and Rome. The museum is situated on Museum Row, 25 Granot Street, and is close to the Givat Ram campus of the Hebrew University of Jerusalem, The Israel Museum and the Bloomfield Science Museum. It is served by the 9, 17, 24 and 99 bus routes. The museum is accessible to the disabled.



### **Arrival from Abroad**

Ben-Gurion International Airport is approximately 50 km (31 miles) west of Jerusalem. Depending on the time of day, it is a 40-55 minute journey between the airport and Jerusalem. The airport lies on Route no.1 which links Tel-Aviv and Jerusalem.

### **Public Transport**

Buses operated by the Egged Co-operative run to Jerusalem Central Bus Station. They depart from the main terminal (terminal 3) on the second level next to gates 21 and 23. Please check the Egged website for bus times [www.egged.co.il/Eng](http://www.egged.co.il/Eng)

Taxis to all destinations are located on ground floor level and reached by exiting the arrivals hall. A taxi rank and dispatcher's station will assist you in locating a taxi. In addition Neshar Tours runs a shared taxi service (sherut) based on a fixed rate per passenger between the airport and your hotel in Jerusalem. The shared taxi departure point is also located on the ground floor by exiting the arrivals hall.

### **Accommodation**

The Bible Lands Museum Jerusalem has the following special rates at The Three Arches Hotel in the centre of Jerusalem ([www.ymca3arch.co.il](http://www.ymca3arch.co.il)):

Single room with private bathroom facilities- \$60 per night Double room with private bathroom facilities - \$ 85 per night

Rates include buffet breakfast. If you would like us to book you a room at this facility, please contact us. If you would like alternative recommendations for accommodation, we shall be happy to assist. However, reservations for alternative accommodation should be made by participants directly with the hotel and not via the museum.

### **Contact Details and Further information**

\*\*\*\*\*

Bible Lands Museum Jerusalem  
POB 4670  
Jerusalem 91046  
Israel

Tel: 972-(0)2-561 1066  
Fax: 972-(0)2-563 8228

Museum website: [www.blmj.org](http://www.blmj.org) <<http://www.blmj.org/>>

To request a registration form please contact the conference administrator, Carolyn Budow Ben-David at [curatorial@blmj.org](mailto:curatorial@blmj.org)

\*\*\*\*\*

# **CALL FOR APPLICANTS FOR PARTICIPATION IN THE COURSE, “FIELD SCHOOL ON ARCHAEOLOGICAL SCIENCE”**

**(For students who are registered in universities outside Israel)**

Dear all,

Please pass this on to all interested parties – apologies for cross-postings!

Aren Maeir

The course “Field school on archaeological science” is offered by The Martin (Szusz) Department of Land of Israel Studies and Archaeology, Bar-Ilan University, and the Kimmel Center for Archaeological Science, Weizmann Institute of Science, Israel. Registered students will participate in the excavation of the Biblical site Tell es-Safi, identified with Philistine Gath. The purpose of the course is to expose the students to interdisciplinary research that involves archaeology and the natural sciences, in the field. The students will experience interactive work that combines excavation and analysis of materials using an on-site laboratory. The course will emphasize the inter-connection between laboratory analyses and the archaeological context, and will include fieldwork, laboratory work, and lectures.

The course will take place between July 13<sup>th</sup> and 18<sup>th</sup>, 2008. Accommodation and food will be supplied by the excavation organizers at Kibbutz Revadim. The cost for students who are not registered at Bar-Ilan University is \$350 per week. The Kimmel Center will cover the costs for two weeks for the most qualified student (one scholarship only). Applicants with little or no archaeological experience must participate in one week of excavations at Tell es-Safi/Gath between July 6<sup>th</sup> and 11<sup>th</sup>, 2008. An option for participation in a supervised one week project at the site is available between July 20<sup>th</sup> and 25<sup>th</sup>, 2008 upon confirmation with the course organizers.

The course is worth 2 US academic credits. Students interested in receiving the credit will have to pay an additional sum of \$200 to Bar-Ilan University.

Course organizers and their fields of expertise:

Prof. Steve Weiner (WIS): mineralogical analyses, phytoliths, site formation processes

Dr. Elisabetta Boaretto (BIU and WIS): radiocarbon dating, materials analysis

Dr. Ehud Weiss (BIU and WIS): paleoethnobotany

Dr. Ruth Shahack-Gross (BIU and WIS): geoarchaeology, micromorphology

Applications are limited for students from third year undergraduates through Masters and doctoral studies. The best 10 students will be selected. Applications should include one paragraph explaining why the student is interested in participating in this course, CV, list of grades and two names of referees, and sent no later than March 1<sup>st</sup> 2008 to:

\*\*\*\*\*

Dr. Ruth Shahack-Gross  
Kimmel Center for Archaeological Science  
Weizmann Institute of Science  
Rehovot 76100  
Israel  
E-mail: [Ruth.Shahack@Weizmann.ac.il](mailto:Ruth.Shahack@Weizmann.ac.il)

Prof. Aren M. Maeir  
Director, The Tell es-Safi/Gath Archaeological Project  
The Martin (Szusz) Department of Land of Israel Studies and Archaeology  
Bar-Ilan University, Ramat-Gan 52900, ISRAEL  
Tel (W) +972-3-5318299/8350; (M) +972-54-6205082  
Fax (W) +972-3-6354941  
email: [maeira@mail.biu.ac.il](mailto:maeira@mail.biu.ac.il); [arenmaeir@gmail.com](mailto:arenmaeir@gmail.com)  
project website: [www.dig-gath.org](http://www.dig-gath.org)  
project weblog: <http://gath.wordpress.com>

\*\*\*\*\*



**INTERNATIONAL CONGRESS**  
**VILLANOVAFORRU (CAGLIARI-**  
**SARDINIA-ITALY): THE NURAGIANS,**  
**THE PHOENICIANS AND THE OTHERS.**  
**SARDINIA BETWEEN THE FINAL**  
**BRONZE AGE AND THE EARLY IRON**  
**AGE, 14-15 DECEMBER 2007**

Dear all,

I believe this will be of interest to many.

Luca Girella

International Congress Villanovaforru (Cagliari-Sardinia-Italy):  
14-15 December 2007

**I Nuragici, I Fenici e gli altri. Sardegna tra Bronzo Finale e prima età del Ferro.**

The Nuragians, the Phoenicians and the others. Sardinia between the final Bronze Age and the Early Iron Age

More information are in: [www.inuragiciegliatri.it](http://www.inuragiciegliatri.it)

**CALL FOR PAPERS AND POSTERS: “WHAT  
WOULD A BRONZE AGE WORLD SYSTEM  
LOOK LIKE? WORLD-SYSTEMS  
APPROACHES TO EUROPE AND WESTERN  
ASIA 4<sup>TH</sup> TO 1<sup>ST</sup> MILLENNIA BC”, 1<sup>ST</sup>-4<sup>TH</sup>  
APRIL 2008, DEPARTMENT OF  
ARCHAEOLOGY, UNIVERSITY OF  
SHEFFIELD, UK**

Submission Deadline: 21st December 2007.

<http://www.ancientworldsystems.group.shef.ac.uk/>

Submissions: [worldsystems@shef.ac.uk](mailto:worldsystems@shef.ac.uk)

The Department of Archaeology, University of Sheffield is proud to host this forthcoming international conference on ancient world-systems in memory of Andrew Sherratt. The aim of this conference is to review the applicability of a world-systems perspective to the complex material remains of what might very loosely be called early Europe, extending from Anatolia and the eastern Mediterranean in the south-east to the Atlantic and North Sea in the north-west, and covering a span from the 4th to the 1st millennium BC. It is hoped to examine the ways in which (if at all) such a perspective can best be adapted to prehistoric and early historic contexts, and to discuss the pitfalls which may lie in the way of such adaptations. In particular, it will confront the problem of maintaining some sort of balance between ideas of eastern influence and regional autonomy by identifying in detail which aspects of European societies can best be viewed from this standpoint, and by attempting to reconstruct the mechanisms by which external stimuli may have had a significant impact upon processes of social reproduction.

Those who have already confirmed they will be presenting at this conference:

Alex Bauer, Cyprian Broodbank, Paul Halstead, Philip Kohl, Kristian Kristiansen, Mario Liverani, Joseph Maran, Jane Schneider, David Wengrow, Greg Woolf, Norman Yoffee

Please use the form provided on the web to submit titles and abstracts for papers or posters.

\*\*\*\*\*

John Bennet,  
Head of Department & Professor of Aegean Archaeology  
Department of Archaeology,  
University of Sheffield  
Northgate House  
West Street                      T: +44 (0)114-2225103  
Sheffield S1 4ET                F: +44 (0)114-2722563

England, UK      E: [d.j.bennet@sheffield.ac.uk](mailto:d.j.bennet@sheffield.ac.uk)

\*\*\*\*\*

---

# **ESF EUROCLIMATE SPRING SCHOOL** **"LATE QUATERNARY TIMESCALES** **AND CHRONOLOGY",** **PIRAN/SLOVENIA, 20 - 26 APRIL, 2008**

Please find below an announcement for the ESF EuroClimate Spring School on Chronology in Piran/Slovenia, 20-26 April, 2008. Deadline for applications is extended to 31 December 2007 and is open for participants from the whole palaeoclimate community (not restricted to EuroClimate researchers or Europeans).

A temporal and spatial reconstruction of past climatic and environmental conditions can only be attempted if the observed changes can be placed on an accurate timescale and if the changes seen on land and in the ocean can be accurately linked with each other and with ice core records. This linkage is necessary to understand all parts of Earth's climate system and to decipher the timing of responses to a certain forcing mechanism and resulting feedbacks.

Detailed knowledge of the advantages and limitations of different dating and statistical techniques is crucial for a correct assessment of the technique to be applied to date a specific sequence, for age model construction and correlations between archives. Much of this knowledge is limited to a small group of specialists in the respective dating technique field. The Chronology Spring School aims at transmitting this information to graduate students and postdoctoral researchers to enhance knowledge and understanding of Late Quaternary time scales.

Specific issues to be addressed are: (i) Choice of dating method and sample material ( $^{14}\text{C}$ , U/Th, IRSL/OSL, Ar/Ar; dendrochronology, tephrochronology, laminated sediments, speleothems); (ii) Calibration and age-depth model construction; (iii) Correlation among archives.

Leading researchers in their respective fields will give lectures and tutorials on the specific methods and their application. Discussion groups will address state-of-the-art issues and problem solving approaches.

## Organizers

Barbara Wohlfarth (Stockholm University) Bernd Kromer (Heidelberg Academy of Sciences) Daniela Turk (European Science Foundation) ESF EuroCLIMATE community

## List of Lecturers:

Juerg Beer, Svante Björck, Maarten Blaauw, Katarina Cufar, Larry Edwards, Sidney Hemming, Chris Hendy, Konrad Hughen, Susan Ivy-Ochs, Sigfus Johnsen, Bernd Kromer, Frank Preusser, Paula Reimer, Ian Snowball, Dirk Verschuren, Barbara Wohlfarth

## Applications and Participation

Applications from PhD students and postdoctoral researchers from within the wider EuroCLIMATE community are welcome. Participating students are requested to present their own work in a short oral presentation (10 min) and as a poster. Participation is limited to ca. 40 students. The European Science Foundations (EuroCLIMATE) covers registration fees, accommodation and all meals. Participants have to cover their own travel expenses to and from Piran.

Applicants should submit a short outline of their PhD or postdoctoral work and explain the benefits of the Chronology Spring School for their ongoing work on maximum one A4 page. Applications should be submitted by e-mail to: Bernd.Kromer@iup.uni-heidelberg.de no later than December 31, 2007.

<http://www.esf.org/euroclimate>

A flyer can be downloaded at

[http://www.anst.uu.se/maabl971/Chronology\\_Spring\\_School.pdf](http://www.anst.uu.se/maabl971/Chronology_Spring_School.pdf)

\*\*\*\*\*

Dr. Maarten Blaauw

Dep. of Archaeology & Palaeoecology  
Queen's University Belfast, UK  
On leave from Dep. of Earth Sciences  
Uppsala University, Sweden

email [maarten.blaauw@geo.uu.se](mailto:maarten.blaauw@geo.uu.se)

www <http://www.anst.uu.se/maabl971/>

tel +44 (0)28 9097 3895

\*\*\*\*\*





## **SAFA (SOCIETY OF AFRICANIST ARCHAEOLOGISTS) CONFERENCE, FRANKFURT, SEPTEMBER 8-11, 2008**

Dear all,

For the next SAfA ([Society of Africanist Archaeologists](#)) conference, taking place in Frankfurt (September 8-11, 2008), we would like to organize a session dedicated to the iron metallurgy: “Iron working: organization of the production and diffusion patterns (iron, objects, knowledge)”. The subject could be treated in an archaeological, ethno-archaeological or archaeometric perspective. Questions of particular interest are: technology (furnaces, slags), organization of the production (volume, craftsmen, control), diffusion and consumption of iron and tools, and the transfer of knowledge and craftsmanship. If there is sufficient space or interest, we might consider opening the session to contributions on non-ferrous metals too.

People interested in participating in such a session are invited to submit a title and perhaps a small abstract of a few lines to describe their proposed contribution before december 15 to Caroline Robion-Brunner ([robion2@etu.unige.ch](mailto:robion2@etu.unige.ch)) or myself.

Best regards,

Sébastien Perret

\*\*\*\*\*

Sébastien Perret

Mineralogy and Petrography, Departement of Geosciences

University of Fribourg, Chemin du Musée 6, CH-1700 Fribourg, Switzerland

tel: +41 26 300 89 40

mail: [sebastien.perret@unifr.ch](mailto:sebastien.perret@unifr.ch)

Visit our homepage at <http://www.unifr.ch/geoscience/mineralogy/archmet>

\*\*\*\*\*

---

**SUMMER SCHOOL IN ANCIENT AND  
HISTORIC METALS: 2008 HELD AT UCLA:  
COTSEN INSTITUTE OF ARCHAEOLOGY  
MONDAY 18<sup>TH</sup> AUGUST- SATURDAY 23<sup>RD</sup>  
AUGUST 2008**

Dear List members

Please alert your students to the possibility of taking this course on the delightful campus of UCLA in Los Angeles.

SUMMER COURSE: ANCIENT AND HISTORIC METALS: TECHNOLOGY, MICROSTRUCTURE, AND CORROSION.

Summer School in Ancient and Historic Metals: 2008 Held at UCLA: Cotsen Institute of Archaeology Monday 18th August- Saturday 23rd August 2008

Course Aims: This six-day course will act both as an introduction and a focus of more intensive study dealing with the examination, analysis, metallographic examination and deterioration of ancient and historic metals. The course is designed to benefit conservators, scientists and archaeologists who wish to learn how to prepare metallic samples for metallographic study, learn something of the technological aspects of the working and structure of metals, and how corrosion and patination can be discussed and examined.

**Artefacts for examination:**

Over the past 25 years an unrivalled collection of mounted metallographic samples has been assembled, which are studied as part of the course practical work, involving both polarized light microscopy and metallographic microscopy of both freshly polished and etched samples. These samples range from cast iron from China to wootz steel from India, bronze coinage alloys from the Roman Empire to high-tin bronze from ancient Thailand, silver alloys from the Parthian period to ancient Ecuador, gilded copper and tumbaga from Peru and Colombia, to mention only a few of the geographical areas covered by available samples. Course participants will be instructed in the use of polishing and etching in the examination of samples and are encouraged to keep digital images of the samples they have prepared during the week. Students may also bring their own samples for examination if mounted and ground, or if not mounted, then one or two small samples may be brought which can be mounted and prepared during the course.

**Course Instructor:**

Professor David A. Scott, Director of the MA program in Archaeological and Ethnographic Conservation. His book, Copper and Bronze in Art: Corrosion, Colorants,

Conservation won the prize from the Association of American Publishers as the best Scholarly/Art book published in the USA in 2002. Professor Scott has published over 70 papers in the peer-reviewed literature and is an Editor for the journal Studies in Conservation.

Course Schedule: The course will be held over the six days from 18-23 August, 2008. The course will be held at the Cotsen Institute of Archaeology, located in the basement of the Fowler Museum Building at the UCLA campus in Los Angeles from 9:15am-5pm each day.

The course is open to a maximum of 10 participants only.

Course Costs: The cost of the instruction for the six days will be \$800.00. For details of payment and to register for this course, please contact the course organizer and director:

\*\*\*\*\*

Professor David A. Scott  
Room A410  
The Cotsen Institute of Archaeology, UCLA  
405 Hilgard Avenue  
Los Angeles CA 90095-1510, USA  
[dascott@ucla.edu](mailto:dascott@ucla.edu)

\*\*\*\*\*

### **Course Details:**

#### **Monday:**

Introduction, use of the metallurgical microscope, the mounting and polishing of samples, their preparation, use of resins, grinding and polishing. Introduction to phase diagrams and their application to ancient bronzes and copper alloys. Copper-arsenical, copper-nickel, and copper-tin alloys. Casting and working of metals and aspects of bronze casting in the ancient world. Etching of some copper alloys. Recording of samples with digital camera and case studies in the examination of a group of copper alloy plaques and a bronze figurine of the God Osiris will be discussed.

#### **Tuesday:**

Continuation of the examination of copper-tin and copper-tin-lead alloys. Ancient coinage alloys of the Roman period, examination of copper-arsenic bronzes, aspects of the corrosion of bronze and copper alloys. The Pourbaix diagram and some of its applications. The extraction of metals from their ores and some principles of the Ellingham diagram.

#### **Wednesday:**

The phase diagram for copper-silver and lead-tin alloys. Examination of silver and debased silver alloys. Surface enrichment and corrosion. Problems in the authentication of ancient silver and bronze alloys. Metallographic examination of ancient silver alloys and techniques of etching silver. Discontinuous precipitation phenomena and the age of

silver alloys. Colour etching of both copper alloys and silver alloys. The Philosopher plate and the Strozzi silver basin: case studies from the J. Paul Getty Museum.

**Thursday:**

Mounting of samples brought by students. Examination of some ternary phase issues in relation to gold-silver-copper alloys. The corrosion of tumbaga alloys and aspects of the Pourbaix diagram. Video concerning the extraction of iron and steel. Introduction to iron and steel. The principles of corrosion and the eight types of corrosion of metals. The examination of iron from meteorites. The technology of ancient iron and steel in the West, in India and in China will be contrasted and samples illustrating these different technologies examined. The metallography of ancient iron alloys.

**Friday:**

Corrosion issues of iron and steel. Weathering steel and patinas, the nature of iron corrosion products and their implications for the stabilization of iron artefacts during conservation treatments. Problems with the examination of lead, lead-tin, zinc, and aluminium alloys. The reasons why brass was made by cementation, the extraction of metallic zinc and examination of samples of brass alloys. The use of solders and aspects of tinning of ancient bronzes. Examination of mounted specimens prepared on the Tuesday, and continuation of practical metallography.

**Saturday:**

Gold and gold alloys: gilding: examination of gold alloys. Lecture on the technology of ancient gold alloys in South America. Continuation of metallographic practical examination.

---

**ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –**  
**JOB VACANCIES/FELLOWSHIPS**

**UNIVERSITY OF CINCINNATI,**  
**DEPARTMENT OF CLASSICS, MARGO**  
**TYTUS VISITING SCHOLARS PROGRAM**

The University of Cincinnati Classics Department is pleased to announce the Margo Tytus Visiting Scholars Program. Tytus Fellows, in the fields of philology, history and archaeology will ordinarily be at least 5 years beyond receipt of the Ph. D. Apart from residence in Cincinnati during term, the only obligation of Tytus Fellows is to pursue their own research. Fellowships are tenable during the regular academic year (October 1 to June 10).

There are two categories of Tytus Fellowships, long-term and short-term.

**Long Term Fellows** will come to Cincinnati for a minimum of one academic quarter (two and a half months) and a maximum of three during the regular academic year. They will receive a monthly stipend of \$1000 plus housing and a transportation allowance.

**Short Term Fellows** will come to Cincinnati for a minimum of one month and a maximum of two during the regular academic year. They will receive housing and a transportation allowance.

Both Long Term and Short Term Fellows will also receive office space and enjoy the use of the University of Cincinnati and Hebrew Union College Libraries. While at Cincinnati Tytus Fellows will be free to pursue their own research.

The University of Cincinnati Burnam Classics Library is one of the world's premier collections in the field of Classical Studies. Comprising 230,000 volumes, the library covers all aspects of the Classics: the languages and literatures, history, civilization, art, and archaeology. Of special value for scholars is both the richness of the collection and its accessibility -- almost any avenue of research in the classics can be pursued deeply and broadly under a single roof. The unusually comprehensive core collection, which is maintained by three professional classicist librarians, is augmented by several special collections such as 15,000 nineteenth century German Programmschriften, extensive holdings in Palaeography, Byzantine and Modern Greek Studies. At neighboring Hebrew Union College, the Klau Library, with holdings in excess of 450,000 volumes, is rich in Judaica and Near Eastern Studies.

Application Deadline: January 15.

A description of the Tytus Program is available online at [http://classics.uc.edu/resources/tytus\\_scholars\\_program.html](http://classics.uc.edu/resources/tytus_scholars_program.html). There is an online application at <http://classics.uc.edu/resources/tytusap.lasso>. Questions can be directed to [secretary@classics.uc.edu](mailto:secretary@classics.uc.edu).

\*\*\*\*\*

Getzel M. Cohen  
Professor of Classics and History  
Director, Tytus Visiting Scholars Program

Phone: 513-556-1951; Fax: 513-631-1715

Dept. of Classics, 410 Blegen Library, University of Cincinnati, Cincinnati, Ohio 45221-0226

\*\*\*\*\*



## **KIEL UNIVERSITY, NEW GRADUATE SCHOOL "HUMAN DEVELOPMENT IN LANDSCAPES", ADVERTISEMENT OF 20 DOCTORAL STIPENDS**

Dear colleagues,

Kiel University has now started her new Graduate School "Human development in Landscapes", founded within the frame of the German excellence initiative. We are glad to announce the advertisement of 20 doctoral stipends additional to the already advertised 10 stipends (which were deadlined to 16. Nov. 07) for the whole School, which brings together archaeologists, climatologists, social scientists, historians, ecologists, botanists, zoologists, geoscientists, medical scientists and material scientists. Please see the attached advertisement.

Please give this information to any young scientists you think might be interested in a doctoral stipend in the field of archaeology and especially archaeo-/palaeobotany. I will be glad to help with any questions concerning the research field of archaeo-/palaeobotany (e.g. possible PhD-themes etc.).

The following text is just published in Nature:

The "Human Development in Landscapes" Graduate School Kiel devotes itself to interdisciplinary research into the interaction of humans and their environment. Research focuses on landscapes as a dynamic space of social, cultural, and ecological significance and brings together archaeologists, climatologists, social scientists and historians. Interdisciplinary PhD theses will spur on progress in fields such as archaeo-informatics and the cultural anthropological interpretation of materialistic culture. The school intends to test a wide variety of approaches, and to combine methods and mindsets that have been worlds apart until now. In this cluster, Kiel University is cooperating with Leibniz School for Science Education (IPN) and the Archaeological state Museum Schleswig-Holstein.

With its new school Human Development in Landscapes Christian-Albrechts-Universität zu Kiel expands its research and educational activities under the focus "Humans and Environmental Change". The graduate school is funded by the excellence initiative programme of the German Government and supported by the federal state of Schleswig-Holstein. Therefore the CAU (Christian-Albrechts-Universität) offers twenty doctoral stipends for outstanding young researchers

Grants of 1200 €/month will be provided for two years with the option of extension for a further year. Eligible candidates must hold an outstanding university degree in one of the fields relevant to the theme, covering the multidisciplinary scope of "Human Development in Landscapes" (further information at [www.uni-kiel.de/landscapes](http://www.uni-kiel.de/landscapes)). The graduate programme is jointly offered by the Faculties of Humanities, Mathematics and Natural Sciences, Medicine, and Agriculture and Nutrition Sciences. Thus orientation of PhD projects should be interdisciplinary, and supervision will be provided at an inter-

faculty level. Candidates are invited to submit proposals for PhD research projects that should address one of the following themes: "Society and Reflection", "Social Space and Landscape", "Mobility, Innovation, and Change".

Applications including a curriculum vitae, copies of credentials, two letters of reference, and an outline of your PhD research project can be submitted until 20 December 2007 to the coordinator of the proposed Graduate School: Prof. Dr. Johannes Müller, Institute of Prehistoric and Protohistoric Archaeology, Christian-Albrechts-Universität Kiel, D-24098 Kiel

\*\*\*\*\*

Dr. Helmut Kroll  
Institut für Ur- und Frühgeschichte der Universität, 24098 Kiel  
Tel. 0431 880-3654; - 2338; Fax -7300  
Mail [hkroll@ufg.uni-kiel.de](mailto:hkroll@ufg.uni-kiel.de)

\*\*\*\*\*

---



**POSITION AVAILABLE, RHYS  
CARPENTER FACULTY FELLOW IN  
CLASSICAL STUDIES, POSITION IN  
ATHENS**

The American School of Classical Studies at Athens invites applicants with strengths in teaching and research and with proven experience in Greece for an appointment as Rhys Carpenter Faculty Fellow in Classical Studies. The appointment, which begins July 1, 2008, is for a one- or two-year term and is not renewable. Candidates must have the Ph.D. Preference will be given to those who are within seven years of having received the Ph.D. at the time of appointment and who currently hold a position at a North American university. The area of specialization is open; however, the School does not wish to duplicate, but rather to complement the expertise of its staff. Approximately one-half time during the academic year (September through May) will be available for research, and one half-time will be devoted to teaching and related duties, such as leading field trips, advising and directing students in individual research, and planning the academic program. The Faculty Fellow will be expected to contribute generally to the intellectual life of the School. The applicant should provide a description of the research project which he or she intends to carry out at the School. Salary commensurate with experience; benefits and housing or housing allowance, at the discretion of the Executive Committee of the Managing Committee.

A letter of application, a curriculum vitae, project description (up to three pages in length), and three letters of recommendation should be sent to:

\*\*\*\*\*

Professor Susan I. Rotroff  
Chair, Committee on Personnel  
American School of Classical Studies at Athens  
6-8 Charlton Street  
Princeton, NJ 08540-5232.  
Tel: 609-683-0800 Fax: 609-924-0578  
E-mail: [ascsa@ascsa.org](mailto:ascsa@ascsa.org) Web site: <http://www.ascsa.edu.gr>

\*\*\*\*\*

POSTMARK DEADLINE: JANUARY 8, 2008.

The appointment will be announced February 8, 2008, pending approval by the ASCSA Managing Committee.

The American School of Classical Studies at Athens does not discriminate on the basis of race, age, sex, sexual orientation, color, religion, national or ethnic origin, or disability when considering admission to any form of membership or application for employment.

## **UNIVERSITY OF CINCINNATI,** **DEPARTMENT OF CLASSICS, TYTUS** **SUMMER RESIDENCY PROGRAM**

The University of Cincinnati Classics Department is pleased to announce the Margo Tytus Summer Residency Program. Summer Residents, in the fields of philology, history and archaeology will come to Cincinnati for a minimum of one month and a maximum of three during the summer (June 15 - September 15). Apart from residence in Cincinnati during term, the only obligation of Summer Fellows is to pursue their own research. They will receive free university housing. They will also receive office space and enjoy the use of the University of Cincinnati and Hebrew Union College Libraries.

The University of Cincinnati Burnam Classics Library (<http://www.libraries.uc.edu/libraries/classics/index.html>) is one of the world's premier collections in the field of Classical Studies. Comprising 225,000 volumes and other research materials, the library covers all aspects of the Classics: the languages and literatures, history, civilization, art, and archaeology. Of special value for scholars is both the richness of the collection and its accessibility -- almost any avenue of research in the classics can be pursued deeply and broadly under a single roof. The unusually comprehensive core collection, which is maintained by three professional classicist librarians, is augmented by several special collections such as 15,000 nineteenth century German *Programmschriften*, extensive holdings in Palaeography, Byzantine and Modern Greek Studies. At neighboring Hebrew Union College, the Klau Library (<http://library.cn.huc.edu/>), with holdings in excess of 450,000 volumes and other research materials, is rich in Judaica and Near Eastern Studies.

Application Deadline: February 15. Applicants must have the Ph.D. in hand at the time of application.

A description of the Summer Residency Program is available online at <http://classics.uc.edu/resources/tytus2.html>. There is an online application at <http://classics.uc.edu/resources/tytussummerap.lasso>. Questions can be directed to [secretary@classics.uc.edu](mailto:secretary@classics.uc.edu).

\*\*\*\*\*

Getzel M. Cohen  
Professor of Classics and History  
Director, Tytus Visiting Scholars Program  
Phone: 513-556-1951; Fax: 513-631-1715  
Dept. of Classics, 410 Blegen Library, University of Cincinnati, Cincinnati, Ohio 45221-0226

\*\*\*\*\*

## **FIELDWORK OPPORTUNITY AT PYLOS**

The Iklaina Excavation is seeking students and volunteers for the 2008 field season (two sessions: May 31-June 17 and June 17-July 4).

Iklaina is a Mycenaean town identified in the Linear B tablets from Pylos as a-pu2, one of the district capitals of the Hither Province (AJA 2006, pp. 205-228). The project includes excavation, travel to the major sites and museums in the Peloponnese, and evening classes and seminars on Greek culture, history, and archaeology. Students can receive 6 credits through the department of Anthropology at the University of Missouri-St. Louis; volunteers on an auditing basis are also welcome to apply. Applications will be accepted until April 1,

2008 or until the project is filled. All relevant information, including application forms and registration instructions, can be found at the project website, [www.iklaina.org](http://www.iklaina.org).

\*\*\*\*\*

Michael B. Cosmopoulos, Ph.D.

Professor of Archaeology

The Hellenic Government-Karakas Foundation Endowed Professor in Greek Studies  
Department of Anthropology University of Missouri-St. Louis St. Louis, MO. 63121 Tel.  
(314) 516-6241 Fax (314) 516-7235 [www.greekstudies.org](http://www.greekstudies.org)

\*\*\*\*\*

---

## VOLUNTEERS FOR HALAI, SUMMER 2008

The Cornell Halai and East Lokris Project is looking for several volunteers to take part in our six week field season in Greece during the coming summer (June 28-August 10). The archaeological site of Halai, in the village of Theologos, on the North Euboean gulf about 75 miles northwest of Athens, was a settlement in the Neolithic period, followed after a hiatus by a Greco-Roman town with a small fortified seaside acropolis.

Volunteers in 2008 will help with the description and recording of artifacts from Halai in the project's storerooms and with study and conservation at the site. Those interested in archaeological ceramics and in handling and learning about Neolithic architecture and pottery are especially welcome. Volunteers are expected to spend a minimum of 4 weeks with the project.

Living quarters are at our camp at Vivos, 2 miles from the site, and a 4-minute walk from the nearest bay. Our storerooms are at Tragana, 2 1/2 miles from the camp. CHELP covers volunteers' basic living costs while they are in Greece but not travel. Accommodation is in tents.

Those interested in volunteering can contact Coleman by e-mail with queries at [jec13@cornell.edu](mailto:jec13@cornell.edu). To apply, please send an e-mail with relevant personal information, including a resume and contact information for a couple of references.

\*\*\*\*\*

John E. Coleman  
Professor of Classics and Director, Cornell Halai and East Lokris Project (CHELP)  
128 Goldwin Smith Hall, Cornell University  
Ithaca, NY 14853, USA  
Ph. 607-255-8335; 607-255-8327; Fax. 607 254-8899  
Greece: c/o N. Psarras, 35 odos Anapavseos, 35001 Malesina, Phthiotidos, Greece  
webpage. CHELP: <http://halai.arts.cornell.edu>

\*\*\*\*\*

## **THE MEDITERRANEAN** **ARCHAEOLOGICAL TRUST, GRANTS** **TO ASSIST PUBLICATION**

The Mediterranean Archaeological Trust, set up in 1959 for the promotion of the study of archaeology, invites applications for grants, made on a competitive basis, for expenses in 2008-9, in the preparation for publication of material from archaeological \*fieldwork\* in the Mediterranean world, excluding subventions to publishers. Within the terms of the Trust, priority may be given to Bronze Age subjects. Grants for any amount, however small, will be considered, provided they expedite publication. The grants do not normally exceed £ 3000.

Applications comprising a 2000-word-\*maximum\* description of the proposed work and an outline budget, together with two referees' names, should be sent no later than \*15 January 2008\*, to:

Professor Sir John Boardman  
(Mediterranean Archaeological Trust)  
Classics Centre,  
66 St. Giles.  
Oxford OX1 3LU  
[or \*also\* by fax to +44-1865-610237; NOT by email]

The references (which are \*essential\*) should be sent direct by the referees (to meet the deadline of 15 January) or accompany the application in a sealed envelope. Successful applicants will be informed by around the end of March 2008.

---

***ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS***

**METALLURGY IN THE EARLY BRONZE  
AGE AEGEAN, EDITED BY PETER M  
DAY AND ROGER C P DOONAN**

Recently, our understanding of metals and metallurgy in the Early Bronze Age Aegean has been dominated by studies which focus on the circulation and provenance of metals. Over the last decade the study of early metallurgy in the Aegean has witnessed dramatic developments with ever earlier and more detailed evidence for metal production being discovered in the field. Paralleling these field studies are a wealth of new laboratory analyses relating to the material aspects of metal production. This diverse new data when coupled with recent theoretical approaches now allow for significant shifts in our understanding of this important aspect of Aegean prehistory. Since few studies of metallurgy have extended beyond typological analysis of artefacts, the circulation of raw materials and the detailing of technical processes, metallurgy in the Aegean Early Bronze Age was made a subject of discussion at the Sheffield Centre for Aegean Archaeology's Round Table. This volume contains fifteen papers which address aspects of mining smelting and artefact production from a range of theoretical perspectives. It represents the first publication of many of the key details from numerous newly discovered sites. Contributors include Yannis Bassiakos, Phillip Betancourt, Mihalis Catapotis, Peter M. Day, Nota Dimopoulou-Rethemiotaki, Roger Doonan, Myrto Georgakopoulou, Jim Muhly, Georgia Nakou, Olga Philaniotou-Hadjianastasiou, Sue Sherratt, Metaxia Tsipopoulou, Yiannis Papadatos and David E. Wilson. 240p (*Sheffield Studies in Aegean Archaeology, Oxbow Books 2007*)

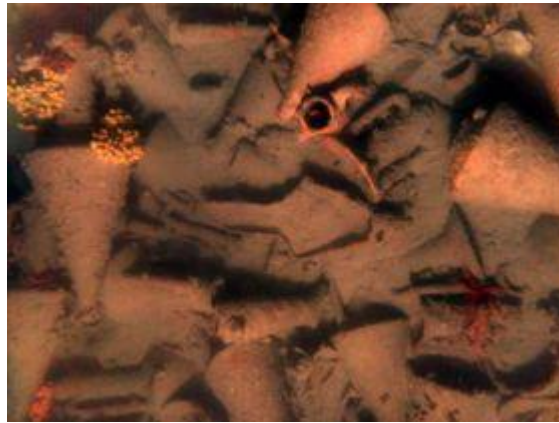
ISBN-13: 978-1-84217-293-3

ISBN-10: 1-84217-293-X

---

## ΕΙΔΗΣΕΙΣ - NEWS RELEASE

### TEAM IDS ANCIENT CARGO FROM DNA



Broken amphoras amid debris on the Aegean seafloor. Photo © / Chios Shipwreck Survey 2005 - WHOI, EUA, HCMR

For the first time, researchers have identified DNA from inside ceramic containers in an ancient shipwreck on the seafloor, making it possible to determine what the ship's cargo was even though there was no visible trace of it.

The findings, by a team from MIT, the Woods Hole Oceanographic Institution (WHOI) and Lund University in Sweden, are being reported in an upcoming issue of the *Journal of Archeological Science*.

By scraping samples from inside two of the containers, called amphoras, the researchers were able to obtain DNA sequences that identified the contents of one as olive oil and oregano. The other probably contained wine, and the researchers are conducting further analyses to confirm this.

Brendan Foley, a lecturer in MIT's Program in Science, Technology and Society (STS) and a researcher at WHOI, and Maria Hansson, a biologist at WHOI and at Lund University in Sweden, found the DNA evidence in the remains of a 2,400-year-old shipwreck that lies 70 meters deep near the Greek island of Chios in the Aegean Sea.

Foley, along with David Mindell, MIT's Frances and David Dibner Professor of the History of Engineering and Manufacturing and director of STS, led an expedition in 2005 that explored the wreck and recovered the amphoras.

Many archeologists specialize in the study of amphoras, which were the cargo containers of the ancient world, used for shipping all kinds of liquid or semi-liquid goods. But the study of these containers can be frustrating, Foley said, because after centuries on the seafloor, the contents have usually been washed away and archeologists are "just left with empty bottles."

The new research points the way toward analyzing hundreds of containers, which could "tell us what was being traded, and something about the total agricultural production of a country," Foley said. Such analysis of ancient crops could even yield insights into the climate of that period.

The discovery of DNA from olive oil and oregano in one amphora came as a surprise, Foley says, because Chios was well-known in the ancient world as a major exporter of highly prized wines, and archeologists had assumed that amphoras from a ship in that area would have been carrying wine.

The other amphora from which Foley and Hansson were able to extract DNA may indeed have contained wine, although that is not yet certain. The short fragments of DNA they found may have come from pistachios or from resins used to coat the insides of amphoras that carried wine. Analysis continues, using present-day samples of plants from the island to pin down the identification.

Their method could be used to identify most plant products that were being shipped, Foley said, but probably not fish products. While these may also have sometimes been carried in amphoras, they would be too hard to identify because of contamination in the marine environment.

Foley and Hansson also studied amphoras from a different shipwreck, a few centuries younger, but found nothing. Foley thinks that's because the second site was much more severely disturbed by weather and currents. "It was badly degraded, smashed up, churned up," he said. It remains to be seen whether the technique also could be used on amphoras that have been stored in museums for many years, or will only work on those that have been freshly brought up from the ocean.

The method could provide new insights into life in ancient Greece and other seafaring civilizations, Foley said. "Imagine if you were asked to analyze the American economy just by looking at the empty shells of 40-foot shipping containers," he said. "You could say something, but not much."

Foley and Hansson have applied for a grant to go back and study a few dozen more amphoras next year, in order to further develop the technique.

**Please visit the site: <http://www.physorg.com/news112978421.html>**

---