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(Ένωση Ελλήνων Χημικών)

**ΔΙΟΙΚΗΤΙΚΟ  
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of Greek Chemists)

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# Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

**- Νοέμβριος 2010 -**

# Newsletter of the Hellenic Society of Archaeometry

**- November 2010 -**

**Nr. 116**

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**ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS**

**AMS-12 CONF. 2ND ANNOUNCEMENT:**  
**CALL FOR ABSTRACTS AND**  
**REGISTRATIONS**

Dear colleagues,

Please join us and international AMS colleagues at the **Twelfth International Conference on Accelerator Mass Spectrometry** to be held in Wellington, New Zealand at the Museum of New Zealand, Te Papa Tongarewa (Te Papa) on **20-25 March 2011** hosted by GNS Science (Institute of Geological and Nuclear Sciences). This conference will bring together scientists from all over the world to discuss recent progress, applications and future trends of AMS for studies in Archaeology, Nuclear Physics, Astrophysics, Cosmogenochemistry, Biomedical Sciences, Earth Sciences, and Nuclear Safeguards.

**The conference is now open for registration and abstract submission. Early-bird registration and the receipt of abstracts closes 15 December 2010.**

The AMS-12 website <http://www.gns.cri.nz/ams12> is not only your gateway to registration and abstract submission, but also a great starting point to book accommodation and to search for activities in and around Wellington city. Also, we welcome the important involvement of sponsors and exhibitors. Interested parties should check out the opportunities formulated on a specific page of our AMS-12 website.

We look forward to welcoming you to beautiful New Zealand and the vibrant city of Wellington for a stimulating conference and a fun time with your colleagues.

Regards

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Albert Zondervan  
AMS-12 Convener  
National Isotope Centre

GNS Science, New Zealand

\*\*\*\*\*



ΕΤΑΙΡΕΙΑ ΜΕΛΕΤΗΣ ΑΡΧΑΙΑΣ ΕΛΛΗΝΙΚΗΣ ΜΥΘΟΛΟΓΙΑΣ (Ε.Μ.Α.Ε.Μ.)  
ΚΛΕΙΣΟΒΗΣ 12, 106 77 ΑΘΗΝΑ  
Τηλ.: 210 5235781, Fax: 210 5230031, E-mail: [emaemsociety@gmail.com](mailto:emaemsociety@gmail.com)

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**ΠΡΟΓΡΑΜΜΑ ΟΜΙΛΙΩΝ ΟΚΤΩΒΡΙΟΥ –**  
**ΔΕΚΕΜΒΡΙΟΥ 2010**  
**ΟΙ ΟΜΙΛΙΕΣ ΕΙΝΑΙ ΑΦΙΕΡΩΜΕΝΕΣ ΣΤΗΝ**  
**ΜΝΗΜΗ ΤΟΥ ΚΑΘ. ΑΝΤΩΝΙΟΥ**  
**ΚΟΝΤΑΡΑΤΟΥ**

Αγαπητά Μέλη και Φίλοι της Ε.Μ.Α.Ε.Μ.,

Σας ενημερώνουμε ότι το Πρόγραμμα Ομιλιών της «Εταιρείας Μελέτης Αρχαίας Ελληνικής Μυθολογίας» για την περίοδο Οκτωβρίου – Δεκεμβρίου 2010 είναι το παρακάτω:

1 Παρασκευή 8 Οκτωβρίου 2010 και ώρα 6 μ.μ

**ΘΕΜΑ:** «Το Μαντείο του Σελιναίου Απόλλωνος στη Βόρεια Εύβοια και η Γεωλογική του Ερμηνεία»

**ΟΜΙΛΗΤΗΣ:** κ. Ιωαν. Μπαντέκας, Δρ. Γεωλογίας

2 Παρασκευή 12 Νοεμβρίου 2010 και ώρα 6 μ.μ.

**ΘΕΜΑ:** «Ηλιακοί Μύθοι και Φυσική Πραγματικότητα»

**ΟΜΙΛΗΤΗΣ:** κ. Στεφ. Παϊπέτης, Καθηγητής Πανεπιστημίου Πατρών

3 Παρασκευή 3 Δεκεμβρίου 2010 και ώρα 6 μ.μ.

**ΘΕΜΑ:** «Συστήματα Ανάρτησης Οικοδομικών Λίθων κατά την Αρχαιότητα»

**ΟΜΙΛΗΤΗΣ:** κ. Αναστ. Νακάσης, Δρ. Αρχιτέκτων

Όλες οι ομιλίες θα πραγματοποιηθούν στην αίθουσα του ισογείου του Εθνικού Ιδρύματος Ερευνών (Βασ. Κωνσταντίνου 48).

**Επικοινωνία:**

Τηλ.: 210 5235781

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E-mail: [emaemsociety@gmail.com](mailto:emaemsociety@gmail.com)

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**2ND CALL FOR ABSTRACTS FOR THE**  
**6TH INTERNATIONAL SYMPOSIUM:**  
**"RADIOCARBON AND**  
**ARCHAEOLOGY", APRIL 10-15TH, 2011**  
**IN PAFOS, CYPRUS**

Deadline for Abstracts: **January 17th, 2011**

Early Bird Registration: **February 21st, 2011**

Dear Colleagues

This is the 2nd Call for Abstracts to the **6th International Symposium: "Radiocarbon and Archaeology"**. As in previous years this meeting brings together renown scholars from all over the world to exchange ideas and to share the latest developments in the merging fields of Radiocarbon and Archaeology.

This year, I hope very much that this symposium will be a turning point in doing research on Radiocarbon and Archaeology with Radiocarbon applied as an independent source of archaeological information, including dating, rather than using it to support or test existing hypotheses.

I wish to thank all those who sent their abstracts to the Symposium.

Please pay attention that the deadline for abstract submission is approaching.

The symposium will be organized in sessions by time-periods; we have prepared a tentative list below which may be subject to modifications depending on the type and number of abstracts received. The meeting will be arranged into oral and poster presentations as well as Plenary talks.

Abstract should be sent to [radioarch@targetconf.com](mailto:radioarch@targetconf.com)

You can find further information about the symposium in the following link:  
<http://www.c14.cyi.ac.cy/>

**TENTATIVE SESSIONS:**

1. Historical Periods
2. Radiocarbon research in the 1st Millennium BC
3. Radiocarbon research in the 2nd Millennium BC
4. Radiocarbon research in the 3rd Millennium BC

5. Reliability of 14C dates beyond 30Ka
6. Radiocarbon chronologies in the Far East
7. Ancient Cultures of the Eurasian steppes: chronology, migrations and interaction
8. Special Archaeological Materials and Techniques for Dating
9. Calibration, Intercomparison, Models and Outliers
10. Dendrochronology and Botanical Remains
11. Microscopic Record in the Archaeological context
12. Radiocarbon samples preservation in relation to different environments

Hope to see you in Cyprus.

*Yours Sincerely,*

\*\*\*\*\*

Elisabetta Boaretto  
*Symposium Chair*  
*Radiocarbon Dating Lab, Weizmann Institute of Science*  
*Bar Ilan University*

Noemi Rebollo  
*Symposium Scientific Secretary*  
*Radiocarbon Dating Lab, Weizmann Institute of Science*  
**Ra6th International Symposium: "Radiocarbon and Archaeology"**  
<http://www.c14.cyi.ac.cy>

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# **SPATIO-TEMPORAL SESSION AT INQUA-2011: ASSESSING THE SPATIO- TEMPORAL RESOLUTION OF FOSSIL PROXIES**

Dear colleagues,

Abstracts are invited for a spatio-temporal session at INQUA-2011: Assessing the Spatio-Temporal Resolution of Fossil Proxies

This session will explore the potential and limitations of temporal and spatial multi-site comparisons for studies of past environmental reconstruction and human/environment interactions. Past environmental change within or across regions is usually reconstructed by extrapolating from a limited number of spatial point estimates (coring sites), with resulting spatial uncertainties. Spatial uncertainties are further increased owing to environmental and ecosystem heterogeneity, internal variability and multiple forcing factors interacting uniquely at each site. Also the timing of proxy events within and between coring sites is often uncertain, owing to, for example, errors in dating and age-modelling, internal variability, problems with extracting signal from noise, and multiple forcing factors expressed distinctly at individual sites. Therefore any spatio-temporal analysis of fossil proxy archives is prone to considerable uncertainties. In this session we will focus on these uncertainties by discussing case studies and methodological developments. It is hoped that an increased quantification of these uncertainties will enable us to understand better the potential and limitations of fossil proxy data for environmental reconstructions.

Deadline for abstract submission is 30 Nov 2010 <http://www.inqua2011.ch/?a=abstracts>

Please do contact us in case you have questions about this session.

Best wishes,

Maarten Blaauw, Nicki Whitehouse and Paula Reimer (session conveners)

\*\*\*\*\*

Dr. Maarten Blaauw  
Lecturer in Chronology  
School of Geography, Archaeology & Palaeoecology Queen's University  
Belfast, UK  
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**ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –**  
**JOB VACANCIES/FELLOWSHIPS**

**ΠΡΟΚΗΡΥΞΗ ΓΙΑ ΜΕΤΑΔΙΔΑΚΤΟΡΙΚΗ**  
**ΕΡΕΥΝΑ**

Αγαπητοί συνάδελφοι

Επειδή μπορεί να ενδιαφέρει μερικούς από εσας, βγήκε η προκήρυξη για μεταδιδακτορική έρευνα, με deadline: 20.11.2010. Δείτε τη στη διεύθυνση:

<http://ypereph.opengov.gr/panaretos/?p=2856>

Σας την επισυνάπτω.

Καλή δύναμη σε όλους σας.

Διονύσης

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Διονύσης Κάβουρας, Καθηγητής  
Ιδρυματικός Υπεύθυνος ΤΕΙ Αθήνας  
Πρόγραμμα "ΘΑΛΗΣ"  
Τηλ.: 210-538-5369

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## **RESEARCH POSITION IN BIOLOGICAL ANTHROPOLOGY, MAX PLANCK INSTITUTE FOR EVOLUTIONARY ANTHROPOLOGY, LEIPZIG, GERMANY**

The Research Group on "Plant Foods and Hominin Dietary Ecology" in the Department of Human Evolution of the Max Planck Institute for Evolutionary Anthropology, Leipzig (Germany) invites applications for a post-doctoral researcher in biological anthropology. In the department, palaeoanthropological research is conducted within a multidisciplinary environment involving three main groups of scientists: biological anthropologists, Palaeolithic archaeologists and archaeological scientists/ geochronologists. More information about the Department of Human Evolution may be found at: <http://www.eva.mpg.de/evolution>.

The position is a research-only post with no teaching obligations with an initial contract of two years that may be extended, to begin January 2011 at the earliest. The project will provide substantial support in a highly stimulating environment. We offer a salary according to German public service regulations (TVöD-Bund). The successful candidate will work closely with Amanda Henry on aspects of plant foods in the dietary ecology of later hominins and modern humans.

We are interested in candidates with a strong background in one or more of the following:

- Stable isotope research, specifically nitrogen, carbon and strontium;
- Human or primate dietary ecology;
- Plant microfossil research.

The selected candidate must have a PhD and ideally will have post-doctoral experience with a strong track record of research.

The Max Planck Society is committed to employing more handicapped individuals and to increasing the percentage of women in areas where they are under-represented, and therefore expressly encourages applications from such qualified individuals.

Applications should send by email, as a single PDF, a cover letter, curriculum vitae, reprints of selected publications, short statement of research interests (2pg maximum), and the names of three referees to Amanda Henry ([phytolith@gmail.com](mailto:phytolith@gmail.com)). Reviews of applications will begin November 30th, 2010 and proceed until the position is filled.

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## **AMERICAN RESEARCH CENTER IN SOFIA ACADEMIC PROGRAM FELLOWSHIP COMPETITION**

**THE PROGRAMS:** The American Research Center in Sofia (ARCS), Bulgaria, offers three programs with accompanying fellowships for the academic year 2011-2012: a Fall term program (September-November 2011) focusing on the history and archaeology of Bulgaria and neighboring countries, from prehistory to the present day; a Spring term program (February-April 2012) focusing on the history of religion in Bulgaria and neighboring countries; and a nine-month program (September 2011-May 2012) which incorporates both Fall and Spring term programs. The programs combine a formal academic curriculum with independent research. ARCS hosts the programs' lectures and seminars; organizes related study trips; facilitates opportunities for taking Bulgarian and other Balkan language classes; and provides logistical support and access to local libraries, museums, and other educational institutions. The Center engages the participants with eminent local scholars relevant to the field of their study and makes arrangements for specialized research at local institutions. Further details about these programs are available on the ARCS webpage ([www.einaudi.cornell.edu/arcs](http://www.einaudi.cornell.edu/arcs)) and the ARCS facebook group page ([www.facebook.com/group.php?gid=106253216070705](http://www.facebook.com/group.php?gid=106253216070705)).

**THE FELLOWSHIPS:** ARCS plans to offer three fellowships for the Fall term program, three for the Spring term program, and one for the nine-month program. The fellowships include a monthly stipend (\$550/month), housing in Bulgaria, language instruction, travel expenses within the academic program, and up to \$1,000 for travel expenses between North America and Bulgaria.

**ELIGIBILITY:** Graduate students engaged in research on ancient, medieval, or modern Bulgaria or the Balkan peninsula, in any field of the humanities and social sciences, are eligible for all three programs. The Fall term and Spring term programs are also open to advanced undergraduate students with similar research interests. Non-U.S. applicants are expected to maintain an affiliation with an educational institution in the United States or Canada. School and university faculty may apply to be admitted for the Fall term or Spring term program, but are ineligible for ARCS fellowships. The American Research Center in Sofia does not discriminate on the basis of race, age, sex, sexual orientation, color, religion, ethnic origin, or disability when considering admission to its programs.

**APPLICATION PROCEDURE:** A complete application consists of: the ARCS application form (available at <http://www.einaudi.cornell.edu/arcs/annualprogram.pdf>); a project proposal describing how participation in the ARCS academic program will serve your research interests (not to exceed three double-spaced pages); a current cv; academic transcripts; and two letters of reference from scholars familiar with your work. These materials must be submitted by email to Professor Kevin Clinton ([kmc1@cornell.edu](mailto:kmc1@cornell.edu)). Chair of the ARCS Fellowship Committee, by February 15, 2011. ARCS expects to notify applicants of the decision of the Fellowship Committee by April 1, 2011.

**CONTACT:** Please direct any questions about ARCS academic programs, fellowships,

or application procedures to Professor Denver Graninger ([graninger.arcs@gmail.com](mailto:graninger.arcs@gmail.com)),  
Director of ARCS.

American Research Center in Sofia, 75 Vasil Petleshkov St., Sofia 1510, Bulgaria  
Tel. (+359 2) 947 9498; FAX: (+359 2) 840 1962

<http://www.einaudi.cornell.edu/arcs/>

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## **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 (<http://www.libraries.uc.edu/libraries/classics/>). Comprising 250,000 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 and an application form is available online at <http://classics.uc.edu/index.php/tytus>. Questions can be directed to [program.coordinator@classics.uc.edu](mailto:program.coordinator@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

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## **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 2011-12, in the preparation for publication of material from archaeological fieldwork in the Mediterranean world, excluding subventions to publishers and publication of material not from a specific excavation. Within the terms of the Trust, priority may be given to publication of Bronze Age sites. Grants for any amount, however small, will be considered, provided they expedite publication. The grants do not normally exceed £ 2000.

Applications comprising a 2000-word (maximum) description of the proposed work and an outline budget, together with two referees' names, and an indication of means of payment, if successful, should be sent no later than 15 January 2011, to:

Professor Sir John Boardman  
(Mediterranean Archaeological Trust)  
Classics Centre  
66 St. Giles  
Oxford OX1 3LU  
G.B.

[or also by fax to 01865 610237; NOT by email]

The references (which are essential) should be sent directly by the referees and must meet the deadline of 15 January, or accompany the application in a sealed envelope. Successful applicants will be informed in April 2011.

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# **POST DOCTORAL FELLOWSHIPS AT** **THE AUSTRALIAN NUCLEAR SCIENCE** **AND TECHNOLOGY ORGANISATION,** **SYDNEY, AUSTRALIA**

**Topics:**

- 1) Ion Sources and Accelerator Mass Spectrometry**
- 2) Cosmogenic beryllium in polar ice sheets as a proxy for past solar variability**

Details can be viewed at <http://www.ansto.gov.au/> under "Vacancies"

Applications must be lodged online.

2 year term (with possible 1 year extension)

Salary: A\$72,358 (plus 15.4% superannuation)

For further information on the research projects:

For topic 1, contact Mike Hotchkis ([mah@ansto.gov.au](mailto:mah@ansto.gov.au))

For topic 2, contact Andrew Smith ([ams@ansto.gov.au](mailto:ams@ansto.gov.au))

**Applications close: 14 November 2010**

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## **ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS**

# **COVERAGE OF EARLY PREHISTORIC ROCK PAINTINGS**

The “StoneWatch-ARAD-Academy e.V.” society for the coverage of early prehistoric rock paintings is an association registered in Germany which was founded from a few foresighted, scientific and humanistic thinking people.

It supports the cooperation between research departments, public authorities and potential investors as well as competent institutions for the following purposes:

The scientific analysis of global sites of rock paintings and their audiovisual coverage as well as the production of publications with the subject “Rock paintings”

Development of concepts and their execution for the protection and restoration of rock paintings

The creation of a database that will be accessible worldwide for every person who is interested in this subject. It can be loaded free of charge from our websites.

Documentation, Archiving and Catalogue of global publications about rock paintings and the cooperation with similar institutions at home and abroad

A distance-learning academy for the purpose of studying rock paintings, their preservation and documentation as well as the realisation of excursions will be affiliated to the society in the foreseeable future.

With the help of the latest methods of data processing and protection, the irreplaceable heritage of humankind will survive for all the time.

In this way, the following generations will benefit from the work of the society, especially in the areas of education, science and cultural research.

**Please visit the site: <http://www.stonewatch.de/index.html>**

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## *INTERNET SITES* **ONLINE NESTOR**

Issues from 2010 of Nestor, a bibliography of Aegean prehistory and related areas, are available in pdf format for download at <http://classics.uc.edu/nestor/>.

The most recent issue (37.6, September 2010) is highlighted on the Issues page. Future issues will become available for download at the same time that print copies are mailed. All current subscribers will continue to receive printed issues through December 2010.

Printed issues will continue to be available for subscription in 2011, but at greatly increased cost, due to the loss of the advantages of bulk printing and mailing rates. The new price structure for print subscriptions to Nestor in 2011 is:

U.S. \$33.00

Canada/Mexico \$38.00

Overseas \$43.00

We regret that we can process payments only in the form of checks in U.S. dollars.

We urge subscribers NOT to renew their subscriptions to the print edition, but to switch to the free download of the pdf files in 2011.

The staff of Nestor thank John Wallrodt for his invaluable assistance and guidance in our transition to digital delivery.

\*\*\*\*\*

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[nestor@classics.uc.edu](mailto:nestor@classics.uc.edu)

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## **BRITISH LIBRARY PUTS GREEK MANUSCRIPTS ONLINE**

The British Library in London has posted more than a quarter of its Greek manuscripts, equating to more than 280 volumes, online, the latest step toward digitising important ancient documents.

The manuscripts, available for free on its website at <[www.bl.uk/manuscripts](http://www.bl.uk/manuscripts)>, are part of one of the most important collections outside Greece for the study of more than 2,000 years of Hellenic culture. The website provides researchers with access to high quality digital images of a major part of the British Library's Greek manuscripts collection, supported by enhanced metadata which enables users to search using key words.

One of the documents on the site is The Theodore Psalter, produced in Constantinople in 1066. It is supposed to be the most significant surviving manuscript illuminated in Constantinople. It is one of the greatest treasures of Byzantine manuscript production and of pivotal importance for the understanding of Byzantine art. Made for Abbot Michael of the Studios monastery there, it is named after its scribe and illuminator, the monk Theodore who produced 435 marginal illustrations that act as a commentary on the text of the Psalms.

The Illuminated Gospels is another important manuscript, a 12th century gospel book which is rare because of its integration of images of Christ's life into the Gospels. This early 10th century manuscript, Dialogues of Lucian, is the oldest surviving manuscript of the works of second-century author Lucian.

Scot McKendrick, Head of History and Classical Studies at the British Library, said in a statement on the museum's website, "This website offers everyone, wherever they may be in the world, the opportunity to engage for the first time with over 100,000 pages of newly digitised, unique manuscripts which provide direct insights into the rich written legacy of the Greeks of classical antiquity, Byzantine times, the Renaissance and beyond."

The British Library holds over 1,000 Greek manuscripts, 3,000 Greek papyri and a comprehensive collection of early Greek printing. These collections make the Library one of the largest and most important centres outside Greece for the study of over 2000 years of Hellenic culture.

The Greek manuscripts that have been digitised provide witnesses of the rich culture of the Greek-speaking peoples from the time of the Iliad and Odyssey throughout the Hellenistic, early Christian, Byzantine and Ottoman eras and beyond. They are fundamental to understanding of the Classical and Byzantine world.

**Read more:** <http://www.digitaljournal.com/article/298236#ixzz11J5wTRnw>

## **WEB SITE FOR THE EXCAVATIONS AT PETRAS, SITEIA**

Dear friends and colleagues,

I am very pleased to announce the creation of the web site for the excavations at Petras, Siteia.

[www.petras-excavations.gr](http://www.petras-excavations.gr)

Looking forward to hearing your comments/observations!

Polla cheretismata from Athens

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Metaxia Tsipopoulou  
Director  
Hellenic Ministry of Culture and Tourism  
National Archive of Monuments

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## ANCIENT NEAR EAST ON GOOGLE EARTH

The Livius.org file of Google Earth markers has been expanded with the limes in Germany and many sites in the ancient Near East; it now contains 1600 ancient sites. It can be downloaded from <http://rambambashi.wordpress.com/2010/10/14/1600-ancient-sites-on-google-earth/>.

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Jona Lendering

<http://www.livius.org/>

<http://www.liviusonderwijs.nl/>

<http://rambambashi.wordpress.com/>

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## **ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS**

# **ARCHAEOLOGY MEETS SCIENCE: BIOMOLECULAR INVESTIGATIONS IN BRONZE AGE GREECE: THE PRIMARY SCIENTIFIC EVIDENCE, 1997-2003**

Bryn Mawr Classical Review 2010.10.70

Yannis Tzedakis, Holley Martlew, Martin K. Jones, Archaeology Meets Science: Biomolecular Investigations in Bronze Age Greece: The Primary Scientific Evidence, 1997-2003. Oxford: Oxbow Books, 2008. Pp. xxiv, 304. ISBN 9781842172384. \$120.00.

Reviewed by Colleen Cummings, Chemeketa Community College  
([colleen.cummings@mail.mcgill.ca](mailto:colleen.cummings@mail.mcgill.ca))

This book is the companion volume to *Minoans and Mycenaeans: Flavours of Their Time* (Greek Ministry of Culture, 1999), a catalogue of a travelling exhibition of pottery from Bronze Age Greece showcasing the vessels and the results of scientific investigations into their contents, alongside zooarchaeological studies and stable isotope analysis of human remains. While the *Minoans and Mycenaeans* volume is written for a general public, *Archaeology Meets Science* presents, in a more technical fashion, the background to the investigations, full results, and recommendations for further investigations. The volume is divided into three main sections: 1) Organic Residue Analysis, 2) Methods and Primary Evidence for Stable Isotope Analysis, and 3) Lessons for the Future, as well as an appendix of site descriptions and a concordance with the *Minoans and Mycenaeans* exhibition catalogue. Of the three primary sections, Organic Residue Analysis is by far the longest, comprising 12 of the 16 papers (a full table of contents is provided at the end of this review).

The introductory chapters highlight the social nature of food, and drawing upon Mary Douglas' metaphor of food as a language, suggest that scientific analysis can be used to identify some of the "vocabulary" of complex culinary symbolic systems. The focus, as outlined, is to build on previous work in Aegean diet based on animal and plant remains by using scientific methods to analyse the pottery vessels that contained foods and the human bodies that ate the foods. Between the time of the exhibition and the publication of this second volume, more sites were included for analysis, and thus, this volume contains articles on several more sites in Crete and the Peloponnese as well as a single more distant site in the Bay of Naples.

In the first section -- Organic Residue Analysis -- two articles provide a history of chemical research in archaeology and an overview of current methods and techniques. Special attention is paid here to the problem of contaminants and to techniques for the identification and exclusion of common contaminants from further analysis. The authors also provide cautionary information on the difficulties of identifying residues with a

particular plant or animal, highlighting that in some cases it is better to present the data in a general matter rather than risk a false identification.

The chapters in this section are predominately data-based, presenting the specific methods used for analysis, the individual pots or sherds, and the results obtained for each. From a scientific point of view, two papers in this section are particularly interesting. The first is Victor Garner's exploration of the use of solvent extraction as a non-destructive approach to organic residue analysis, which enables the investigation of complete vessels considered too valuable for destructive sampling. Also noteworthy is Patrick McGovern et al.'s use of three different, but complementary, methods for analysing organic materials: Diffuse-reflectance infrared Fourier-transform spectrometry (DRIFTS), high performance liquid chromatography, and Feigl chemical spot tests. The combination of these techniques provides multiple strands of evidence to investigate the nature of ancient alcoholic beverages.

The results of the scientific analyses show a range of both expected and surprising results. Firstly, as a wide range of vessel types were tested, it is perhaps not surprising that not all vessels appear to have contained food or drink -- some were potentially used for cosmetic or medicinal preparations. Of the food vessels, many contained evidence for either animal or vegetable (predominantly olive where identifiable) oils, as well as evidence for seasonings and leafy vegetables. Surprises include the identification of iris oil, a rare perfuming ingredient, and the repeated occurrence of wine treated with pine resin and aromatic herbs.

One article in this section provides broader context for the scientific results. Robert Arnott situates the results of the organic residue analysis of one particular site -- Chrysokamino -- in relation to the archaeology of the copper-smelting site and the known health hazards of smelting copper (particularly arsenic poisoning). The contents of the vessels at the site suggest a medicinal concoction rather than food or drink, and Arnott discusses the properties of each of the components found in relation to their potential benefit to the smelters at the site. Based on the evidence, he suggests that there existed an understanding of the "causal relationship between toxicity, injuries and remedies, more than two millennia before Hippocrates and Dioscorides" (p. 116).

The second section of this book is on carbon and nitrogen stable isotope analysis and contains two papers. The first incorporates a lengthy discussion of the methodology and interpretation of stable isotope analysis and goes on to present results from the sites in Crete and Achaia that were part of the initial project that lead to the publication of the first catalogue volume. The second paper expands the data with investigations into three additional Peloponnesian sites. Unfortunately, animal bones from these additional sites were not analysed, so direct comparison of the sites is difficult, but the general result is dietary mixture of protein from plants and terrestrial animals, with substantial contributions of marine protein present only for the individuals buried in Grave Circles A and B at Mycenae.

Lessons for the Future, the final section of the book, also contains only two chapters. These primarily focus on the problem of contamination in archaeological samples and provide practical recommendations for excavators to follow if they plan to perform chemical analyses on either pottery or human remains.

Overall, this book provides an excellent scientific exploration of both ceramic and human remains from Bronze Age Greece, though the focus is primarily on the ceramic evidence. The data are excellently presented, with clear indications of where positive identifications can and cannot be made, and well defined areas for future research. Physically, the book is well-made and the contents are generally free from errors. The bulk of the volume's content is the presentation of new data, making a useful contribution to a growing body of scholarship on dietary practices in the ancient Aegean.

This volume would benefit, however, from a chapter or two pulling the individual threads of research together and situating the results within the broader research paradigms of the Greek Bronze Age. With the notable exception of Arnott's chapter on Chrysokamino, very little archaeological context is provided for the individual finds, making it difficult to discern how the scientific data interact with the rest of the archaeological data from each site. It would be fascinating, for instance, to correlate results from the ceramic vessels with results from the human remains at the cemetery sites. While the goal of integrating scientific analyses with archaeological data is laudable, and the studies themselves are excellent, this volume does not take the further step of clearly illustrating how to integrate scientific data into the broader questions of early Greek culture.

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Section 1:

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Certainty and Doubt in Organic Residue Analysis (Curt W. Beck and Edith Stout)

Analysis of Organic Remains in the Fabric of Minoan and Mycenaean Pottery Sherds by Gas Chromatography – Mass Spectrometry (Curt W. Beck, Edith C. Stout, Karen C. Lee, Adrien A. Chase, and Nicole De Rosa)

Absorbed Organic Residues in Pottery from the Minoan Settlement of Pseira, Crete (Curt W. Beck, Edith C. Stout, Karen M. Wovkulich, and Anna J. J. Phillips)

Organic Residue Analysis: Pseira (Ruth F. Beeston, Joe Palatinus and Curt W. Beck)

Organic Residue Analysis: Chrysokamino (Ruth F. Beeston, Joe Palatinus and Curt E. Beck)

Chrysokamino: Occupational Health and the Earliest Medicines on Crete (Robert Arnott)

Organic Residue Analysis of Ceramics from the Neolithic Cave of Gerani, West Crete (Oliver Craig)

Organic Residues in Pottery of the Bronze Age in Greece (The late John Evans – completed by Victor Garner)



Alternative Approaches to Organic Residue Analysis: The Early Helladic Cemetery at Kalamaki; the Mycenaean Settlement on Salamis; the Late Helladic Cemetery at Sykia, Vivara, settlement of Punta D'Alca, Bay of Naples, Italy (Victor Garner)

Atypical Calcium Carbonate Precipitates in Narrow-necked Late Helladic Jars: A Potential Indicator of Organic Residues (Andrew P. Gize, Margaret White, Steve Caldwell, Mandy Edwards and Roger Speak)

The Chemical Identification of Resinated Wine and a Mixed Fermented Beverage in Bronze Age Pottery Vessels of Greece (Patrick E. McGovern, Donald L. Glusker, Lawrence J. Exner, and Gretchen R. Hall)

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Appendix: Site Descriptions and Catalogue Entries (Holley Martlew, Philip P. Betancourt, Adamandia Vassilogamvrou, Yannis Moschos, Michaelis Gazis, Yannis G. Lolos, Ioanna Efstathiou, M. Marazzi, C. Giardino and C. Pepe)

Please visit the site: <http://bmcr.brynmawr.edu/2010/2010-10-70.html>

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## **EΙΔΗΣΕΙΣ - NEWS RELEASE**

# **MYSTERY SKELETON FOUND AT ANCIENT CYPRIOT SITE**

Experts in Cyprus are trying to unravel the identity of one of the island's older inhabitants, after a skeleton was discovered protruding from a cliff in one of the island's richest archaeological sites.

The intact skeleton was found at Curium in the southwest of the Mediterranean island renowned for its links to the ancient world. The earliest settlements here can be dated as far back as the Neolithic age, about 4,500 BC.

Experts believe the skeleton came to the surface due to years of erosion from the sea. The discovery is reminiscent of three skeletons found embracing in the same area back in the 1980s, the likely victims of a strong earthquake which hit the area around 365 AD.

"It looks like an isolated grave close to the coast," said Maria Hadjicosti, director of the island's Antiquities department.

"It's not a contemporary grave. It is over 200 years old or from the Middle Ages or possibly the Christian period. It's difficult to date because we found nothing else buried with it."

The fact that the grave is facing east-west could also suggest it is a Christian burial, she added.

Previous excavations have unearthed ancient cemeteries which are dotted around the area, which may shed some light as to how old the skeleton is.

Experts now trying to date it say the bones were probably those of an adult, Hadjicosti told Reuters.

(Reporting by Sarah Ktisti; Editing by Steve Addison)

Please visit the site: [http://news.yahoo.com/s/nm/us\\_cyprus\\_skeleton](http://news.yahoo.com/s/nm/us_cyprus_skeleton)

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## **SHIPWRECK MAY YIELD SECRETS OF ANTIQUITY**

The examination of a Mediterranean shipwreck from the 4th century B.C. could shed light on ancient sea routes and trade, researchers say.

The remains of a merchant vessel, full of amphoras that probably had been filled with wine, were discovered in 2006 on the seafloor south of the island of Cyprus. A team has been excavating the site, diving and dredging up important pieces, since then.

The wreck was first discovered in 2006 by fishermen. One of the ship's anchors was also uncovered.

The particularly well-preserved remains, especially the amphoras, which were oval, narrow-necked vases, reveal many clues about the ship's story, the research team says in a new paper.

"We know by having studied a lot of these ceramic containers — we have created catalogs with different shapes — we know where they come from and where they date," said Stella Demesticha, a professor of maritime archaeology at the University of Cyprus, who is leading the shipwreck research team.

The amphoras found at this site, she said, are very typical of those made on the Greek island of Chios in the Aegean Sea.

"We know the red wine from Chios was praised," Demesticha told LiveScience. "It was very good quality, very expensive."

A large collection of olive pits was also discovered at the shipwreck site. The scientists don't know whether the olives were packed as a source of food for sailors or were a commodity to be sold.

The archaeologists aren't sure what caused the vessel to sink, but said the fact that it was found pretty far offshore suggests it was probably downed by a storm or a fire.

"There's a lot to learn from this wreck," Demesticha said. "We know that wine commerce was flourishing in antiquity. But because we haven't excavated many shipwrecks, we don't know many details about how exactly this was happening."

For example, she said, researchers would like to know how cargo was stowed on ships, as well as how trade deals were brokered and how many transactions took place, particularly between people from the Aegean (between Greece and Turkey) and the rest of the Mediterranean, including Cyprus.

"By studying the cargo of the ship, we're going to find more details about contacts between the two areas in that period," Demesticha said.

The findings so far are detailed in a paper in the December 2010 issue of the International Journal of Nautical Archaeology.

**Please visit the site:**

[http://www.msnbc.msn.com/id/39536298/ns/technology\\_and\\_science-science/](http://www.msnbc.msn.com/id/39536298/ns/technology_and_science-science/)

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## **PROJECT TROIA - BRONZE AGE TROY** **JUST KEEPS ON GROWING**

German archaeologists have made new discoveries at modern day Hisarlik, northwest Turkey – ancient Troy.

The finds further confirm the area occupied during the Bronze Age was not limited to the citadel; Troy VI and VII were much larger than originally thought.

The three year research project at Troy – lead by Prof. Ernst Pernicka, from the University of Tübingen's Institute of Pre- and Early History – sees scholars focus on the analysis and publication of materials found since the university started excavations at the site in 1988.

But to investigate – and resolve – outstanding issues, Project Troia does undertake some smaller excavations.

These digs, in combination with geophysical surveying and the drilling of test holes, allow the team to narrow down the Bronze Age occupation below Troy's citadel more closely.

From the early Bronze Age until the Roman Period, at least nine cities – their ruins stacked up to 15 metres high – existed at the archaeological site; Troy I to IX.

This year, the team confirmed the layout of a one kilometre long Late Bronze Age defensive system – a rock-cut ditch – south of the Troy hillfort.

A gate, situated in the southeast area of the trench, is now fully excavated. It is located some 300 metres south of the citadel wall, and dated to about 1300 BC. The passage is about five metres wide, smaller than the ditch's previously excavated southern gate.

Late Bronze Age layers came to light in the vicinity of the southeastern gate – remains of walls, roads, storage pits and even an ancient oven. The finds suggest the area was occupied from about about 1700 (Troy VI) to 1100 BC (Troy VII). Soil samples, taken 200 metres east of the citadel, reveal Bronze Age remains as well.

Further east, a second trench was discovered, significantly deeper and wider than the excavated ditch. This structure isn't dated yet, but will be further examined next season. Map of the 2010 excavations by the University of Tübingen at Hisarlik, Turkey - ancient Troy.

Map of Late Bronze Age Troy, at Hisarlik, Turkey. It shows the excavations and test holes from the 2010 season. ( Burg/Citadel, Bohrungen/Drilling, Bronzezeit-Schicht/Bronze Age layer, Tor/Gate)

The archaeological site of Hisarlik was first excavated in the 19th century – not without controversy – by self-taught archaeologists Heinrich Schliemann.

Rather than being one ancient city, it consists of multiple layers of ruins. From the early Bronze Age (3rd millennium BC) until the Roman Period (1st century BC), at least nine cities – Troy I to IX – existed at the archaeological site; there ruins are stacked up to 15 metres high (nicely shown in the timeline on the University of Cincinnati's website).

Which of these remains – if any – are those of the Homeric city of Troy, is still debated.

Schliemann nominated Troy I or II, but nowadays the Late Hittite Troy VII – showing traces of fire and possibly warfare – is seen as the most likely source of inspiration for the Trojan myth. Its remains are dated between the 13th and 10th century BC, where as ancient Greek historians place the Trojan War somewhere in the 12th to 14th century BC.

That Troy VI and VII are far larger than originally thought – not a mere hillfort, but strongholds surrounded by a settlement with its own defensive structures – makes it more likely Hisarlik is indeed the site of the legendary Troy, or Ilion, the siege of which was described by Homer in the Iliad.

**Please visit the site:**

<http://heritage-key.com/blogs/ann/project-troia-bronze-age-troy-just-keeps-growing>

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## **HOW 5000-YR-OLD NEOLITHIC MEN PAINTED THEIR HOMES**

A new research has revealed that our ancestors from 5,000 years ago painted their homes to brighten up their places too.

They used red, yellow and orange pigments from ground-up minerals and bound it with animal fat and eggs to make their paint, the new study from a Stone Age settlement on the island of Orkney revealed.

Several stones used to form the buildings painted and decorated by the locals in about 3,000 BC, most probably to to enhance important buildings and may have been found in entranceways or areas of the building, which had particular significance.

""We have found seven stones in this ritual centre. Some of them were covered in paint and others appear to have had designs such as chevrons and zig zags painted on," The Daily Mail quoted Nick Card, of the Orkney Research Centre for Archaeology, as saying.

"Paint pots have been found at various other sites before but we assumed this was for personal adornment. But we now know they used it to paint their walls," he added.

The study also found that humans used earthy colours like oranges, yellows and reddish-browns pigments probably derived from various minerals that had been crushed up and then mixed with animal fat or eggs.

**Please visit the site: <http://www.newkerala.com/news/world/fullnews-73755.html>**

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## **SCIENCE AND ART BRING YOUNG CARTHAGINIAN 'BACK TO LIFE'**

Clad in a white linen tunic, sandals in the ancient Carthaginian style and a pendant and beads like those found with his remains, 2,500-year-old "Ariche" has virtually come back to life on the sacred hill of Byrsa where he was born.

The outcome of scientific cooperation between France and Tunisia, the young man has been remodelled and returned to his native soil in historical Carthage, a city state that lasted from 814 B.C. to 146 B.C. He will be given a place of honour in the museum of modern-day Carthage, north of Tunis.

"The distance that separates the centuries has been erased, the bones are given flesh and the eyes light up anew in a young man who lived right here six centuries before our own era," French ambassador Pierre Menat said at the opening of the exhibition last week.

The modern history of the youth of Byrsa began in 1994 with the fortuitous discovery of a sepulchre on the southern flank of the hill, which is one of the most famous sites of antique Carthage. A joint Franco-Tunisian team moved in to excavate.

"Gone too soon, taken prematurely from life and the love of those close to him (...) he was doubtless of noble birth and his body was buried in this generous African soil," said Leila Sebai, president of the International Council of Museums and commissioner of the exhibition.

An anthropological study of the skeleton showed that the man died between the age of 19 and 24, had a pretty robust physique and was 1.7 metres (five feet six inches) tall, according to a description by Jean Paul Morel, director of the French archaeological team at Carthage Byrsa.

The man from Byrsa has been rebaptised Ariche -- meaning the desired man -- at the initiative of Culture Minister Abderraouf Basti, who inaugurated the exhibition.

Ariche has regained an almost living human appearance very close in physiognomy to a Carthaginian of the 6th century B.C. after a dermoplastic reconstruction undertaken in Paris by Elisabeth Daynes, a sculptor specialising in hyper-realistic reconstructions.

"He comes back to us thanks to scientific rigour, notably that of paleo-anthropology and forensic medicine, but also the magic of art, that of Elisabeth Daynes, who knows how to bring many faces back from the distant past," Sebai said.

Dermoplastic reconstruction is based on a scientific technique that enables experts to restore the features of an individual with 95 percent accuracy, though some aspects, such as the colour of the eyes and the hair remain partially subjective, she added.

"We can clearly see that this exceptional witness to Carthage in the Punic era is a Mediterranean man, he has all the characteristics," noted Sihem Roudesli, a paleo-anthropologist at the Tunisian National Heritage Institute.



"I hope that like his contemporaries, legendary sailors and bringers of civilisation, this young man can travel across the seas to bear witness on other continents to the greatness of Carthage," Menat said.

Repatriated on September 24, Ariche will be on show at Byrsa until the end of March 2011 when he will travel to Lebanon, the land of the Phoenicians who founded Carthage, for an exhibition at the American University of Beirut.

**Please visit the site:**

[http://news.yahoo.com/s/afp/20101028/sc\\_afp/tunisiafrancearchaeologyhistory\\_20101028060104](http://news.yahoo.com/s/afp/20101028/sc_afp/tunisiafrancearchaeologyhistory_20101028060104)

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## **SHIPWRECKS ENDANGERED**

Scientists warned here Monday that underwater cultural heritages are in danger as shipwrecks and underwater ruins are becoming increasingly accessible.

The issue is the focus point of 3-day regional meeting on the protection of the underwater cultural heritage, which is hosted by the Istanbul Archeology Museum and organized by UNESCO.

More than 50 specialists and representatives from some 20 Mediterranean, Black Sea and Arab countries are attending the meeting which aims to promote the convention and its scientific protection standards among UNESCO member states.

The meeting, which also draws specialists from Britain, Australia and the Netherlands, introduces UNESCO efforts at the protection of underwater cultural heritage, and country representatives present the current status of the legal and practical protections of underwater cultural heritage as well as the situation of underwater archaeology in their countries.

Ulrike Guerin, Secretary of the Convention on the protection of the Underwater Cultural Heritage of UNESCO, said that the underwater cultural heritage faces danger of destruction, looting and commercial exploitation.

"Professional equipment and a high level training remain necessary to undertake excavations since such sites are no longer beyond the reach of treasure hunters," she said.

It is estimated that over 3 million undiscovered shipwrecks spread across ocean floors around the planet. The Dictionary of Disasters at Sea listed for instance 12,542 sailing ships and war vessels lost at sea between 1824 and 1962 alone.

Many famous vessels have perished, inspiring books and films, including the Armada of Philip II of Spain, the Titanic, the fleet of Kublai Khan, the ships of Christopher Columbus, and the Spanish galleons that plied the seas between Americas and Spain.

Similarly, the remains of countless ancient buildings are now submerged underwater, according to UNESCO.

Hakan Oniz, archaeologist and professor of Turkey called for cooperation in the region for protection of underwater cultural heritage while briefing delegates of his country's efforts in protecting underwater heritages.

Initiated in 2001 with the signatures of nine countries, the UNESCO Protection of the Underwater Cultural Heritage Convention, now sets the basics for the protection of underwater cultural heritage in coastal and high seas with signatures from more than 40 countries.

Editor: Zhang Xiang

Please visit the site: [http://news.xinhuanet.com/english2010/culture/2010-10/25/c\\_13574631.htm](http://news.xinhuanet.com/english2010/culture/2010-10/25/c_13574631.htm)

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## **ARCHAEOLOGISTS UNCOVER EARLY NEOLITHIC ACTIVITY ON CYPRUS** **CLASSICS AND ARCHAEOLOGY** **STUDENTS**

Cornell archaeologists are helping to rewrite the early prehistory of human civilization on Cyprus, with evidence that hunter-gatherers began to form agricultural settlements on the island half a millennium earlier than previously believed.

Beginning with pedestrian surveys of promising sites in 2005, students have assisted with fieldwork on Cyprus led by professor of classics Sturt Manning, director of Cornell's archaeology program. The project, Elaborating the Early Neolithic on Cyprus (EENC), has involved undergraduate and graduate students from Cornell, the University of Toronto and the University of Cyprus.

Their findings were published recently in the leading archaeological journal *Antiquity*, after being reported to Cyprus' Department of Antiquities and presented at an annual archaeological conference there.

"Up until two decades ago, nobody thought anybody had gone to Cyprus before about 8,000 years ago, and the island was treated as irrelevant to the development of the Neolithic in the Near East," Manning said.

"Then Alan Simmons (now at the University of Nevada, Las Vegas) discovered a couple of sites that seemed to suggest Epipaleolithic peoples went there maybe about 12,000 or 13,000 years ago, much earlier than anyone had thought possible. The big question started to become in the field, well, what happened in between?"

Subsequent finds pushed the Neolithic evidence on Cyprus back to around 10,000 years ago, but "no one has been able to fill in a 2,000-year gap between this possible first evidence of humans ever going near the island and apparent evidence of proper settlement and farming and agriculture," Manning said.

Based on their survey work since 2006, Manning and colleagues focused efforts on a potentially very early Neolithic site in central Cyprus at Ayia Varvara Asprokremnos (AVA).

"We found this site by doing the opposite of the normal strategy -- people had been looking around the coast," Manning said. "The coast around 11,000 years ago basically is now 50 to a couple hundred meters offshore from the present coastline, because sea level has risen. We [said we] should go inland, and look at the type of place that a hunter-gatherer on the island might try to be a hunter-gatherer or an incipient agriculturalist."

The AVA site "had early Holocene soils, was near the key resources for a human population about 11,000 years ago, and [our surveys] produced lots of evidence of stone tool production," he said. "It was right in the bend of the only permanent river in this

whole area of Cyprus, so it seemed to be a perfect strategic spot for an early hunter-gatherer."

There was chert nearby to make stone tools, and hand auger tests found intact soil samples and a single small lithic flake "we thought to be of the right technology to be very early in date," Manning said.

During seasons of fieldwork in 2007, 2008 and 2009, the team excavated several hundred square meters of the site, and intensively surveyed the surrounding area. Six different charcoal samples from the excavations were carbon-dated and securely estimated to be from the Pre-Pottery Neolithic A period, the initial phase of the Near Eastern Neolithic -- "the very origins of the agricultural revolution," Manning said.

"The dates came out to be almost 11,000 years old from today, so we're talking the earlier ninth millennium B.C. ... which puts them around half a millennium earlier than any other Neolithic that's ever been recognized or claimed and dated on the island of Cyprus," he said.

"More dramatically, these dates mean that Cyprus, an island tens of miles off the Levantine coast, was involved in the very early Neolithic world, and thus long-distance sea travel and maritime communication must now be actively factored into discussions of how the Neolithic developed and spread."

Manning terms the results "part of a field reassessment -- these findings, Cyprus and the maritime component to the development of the Neolithic will now all have to be part of the conversation. These and other findings may change how prehistory is taught at universities and colleges."

The fieldwork and carbon dating were supported by the Department of Classics and the Provost's Special Research Fund.

**Please visit the site:**

<http://www.news.cornell.edu/stories/Oct10/ManningCyprus.html>

## **EXCAVATIONS AT OCCUPIED SALAMINA REVEAL STATUE OF HADES**

Turkish Cypriot daily Star Kibris reports that the excavations at occupied Salamina, conducted by Eastern Mediterranean University (EMU) and Ankara University (AU), have been completed for this year.

Professor Dr. Coskun Ozgunel, from AU Language, History and Geography School, speaking in an Ankara Anatolia correspondent said that this year excavations were extended to the north and west of the Roman Bath in order to unearth the west lines of the room which must have been the Frigidarium. As a result of the excavations on the west wall, niches were found where possibly there were sculptures. Further excavation revealed the statues of a man and a woman, which are believed to be Hades and his wife Persefoni.

Please visit the site: <http://www.hri.org/news/cyprus/tcpr/2010/10-10-19.tcpr.html#08>

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# **NEOLITHIC IMMIGRATION - HOW MIDDLE EASTERN MILK DRINKERS CONQUERED EUROPE BY MATTHIAS SCHULZ**

New research has revealed that agriculture came to Europe amid a wave of immigration from the Middle East during the Neolithic period. The newcomers won out over the locals because of their sophisticated culture, mastery of agriculture -- and their miracle food, milk.

Wedged in between dump trucks and excavators, archeologist Birgit Srock is drawing the outline of a 7,200-year-old posthole. A concrete mixing plant is visible on the horizon. She is here because, during the construction of a high-speed rail line between the German cities of Nuremberg and Berlin, workers happened upon a large Neolithic settlement in the Upper Franconia region of northern Bavaria.

The remains of more than 40 houses were unearthed, as well as skeletons, a spinning wheel, bulbous clay vessels, cows' teeth and broken sieves for cheese production -- a typical settlement of the so-called Linear Pottery culture (named after the patterns on their pottery).

This ancient culture provided us with the blessing of bread baking. At around 5300 BC, everyone in Central Europe was suddenly farming and raising livestock. The members of the Linear Pottery culture kept cows in wooden pens, used rubbing stones and harvested grain. Within less than 300 years, the sedentary lifestyle had spread to the Paris basin.

The reasons behind the rapid shift have long been a mystery. Was it an idea that spread through Central Europe at the time, or an entire people?

## **Peaceful Cooperation or Invasion?**

Many academics felt that the latter was inconceivable. Agriculture was invented in the Middle East, but many researchers found it hard to believe that people from that part of the world would have embarked on an endless march across the Bosphorus and into the north.

Jens Lüning, a German archaeologist who specializes in the prehistoric period, was influential in establishing the conventional wisdom on the developments, namely that a small group of immigrants inducted the established inhabitants of Central Europe into sowing and milking with "missionary zeal." The new knowledge was then quickly passed on to others. This process continued at a swift pace, in a spirit of "peaceful cooperation," according to Lüning.

But now doubts are being raised on that explanation. New excavations in Turkey, as well as genetic analyses of domestic animals and Stone Age skeletons, paint a completely different picture:

At around 7000 BC, a mass migration of farmers began from the Middle East to Europe. These ancient farmers brought along domesticated cattle and pigs. There was no interbreeding between the intruders and the original population.

### **Mutated for Milk**

The new settlers also had something of a miracle food at their disposal. They produced fresh milk, which, as a result of a genetic mutation, they were soon able to drink in large quantities. The result was that the population of farmers grew and grew.

These striking insights come from biologists and chemists. In a barrage of articles in professional journals like *Nature* and *BMC Evolutionary Biology*, they have turned many of the prevailing views upside down over the course of the last three years.

The most important group is working on the "Leche" project (the name is inspired by the Spanish word for milk), an association of 13 research institutes in seven European Union countries. The goal of the project is to genetically probe the beginnings of butter, milk and cheese.

An unusual circumstance has made this research possible in the first place. *Homo sapiens* was originally unable to digest raw milk. Generally, the human body only produces an enzyme that can break down lactose in the small intestine during the first few years of life. Indeed, most adults in Asia and Africa react to cow's milk with nausea, flatulence and diarrhea.

But the situation is different in Europe, where many people carry a minute modification of chromosome 2 that enables them to digest lactose throughout their life without experiencing intestinal problems. The percentage of people with this modification is the highest among Britons and Scandinavians (see graphic).

It has long been known that these differences are based on Europeans' primeval origins. But where did the first milk drinker live? Which early man was the first to feast on cow's milk without suffering the consequences?

### **Groups Did not Intermingle**

In a bid to solve the mystery, molecular biologists have sawed into and analyzed countless Neolithic bones. The breakthrough came last year, when scientists discovered that the first milk drinkers lived in the territory of present-day Austria, Hungary and Slovakia.

But that was also where the nucleus of the Linear Pottery culture was located. "The trait of lactose tolerance quickly became established in the population," explains Joachim Burger, an anthropologist from the University of Mainz in southwestern Germany who is a member of the Leche team.

Deep-frozen thighs are stacked in Burger's laboratory, where assistants wearing masks saw open skulls. Others examine bits of genetic material from the Stone Age under a blue light.



The group will hold a working meeting in Uppsala, Sweden in November. But even at this stage it is already clear that large numbers of people from the Middle East once descended upon Central Europe.

There are also signs of conflict. The intruders differed from the continent's Ice Age inhabitants "through completely different genetic lines," Burger explains. In other words, the two groups did not intermingle.

### **Tension Between Locals and Incomers**

This isn't exactly surprising. The old hunter-gatherers on the continent had long been accustomed to hunting and fishing. Their ancestors had entered Europe 46,000 years ago -- early enough to have encountered the Neanderthals.

The early farmers moving into Central Europe were sophisticated compared with these children of nature. The farmers wore different clothing, prayed to other idols and spoke a different language.

It was these differences that probably led to tensions. Researchers have discovered that arsonists set the villages of the Linear Pottery culture on fire. Soon the farmers built tall palisades to protect their villages. Their advance was blocked for a long time by the Rhine River, however.

There are signs that bartering and trade existed, but the two groups did not intermingle sexually. Burger suspects that there was probably a "strict ban on intermarriage."

The farmers even protected their livestock from outside influences, determined to prevent the wild oxen known as aurochs from breeding with their Middle Eastern cows. They feared that such hybrids would only introduce a new wild element into the domesticated breeds.

Their breeding precautions were completely understandable. The revolutionary idea that man could subjugate plants and animals went hand in hand with enormous efforts, patience and ingenuity. The process took thousands of years.

### **Getting Animals Under Control**

The beginnings can now be delineated relatively well. About 12,000 years ago, the zone between the Zagros Mountains in present-day Iran, Palestine and Turkey was transformed into a giant field experiment.

The first farmers learned to cultivate wild emmer and einkorn wheat. Then they went on to domesticate animals. Goats had been successfully domesticated in Iran by about 9,000 BC. Sheep and pigs were domesticated in southern Anatolia.

Enormous settlements soon sprang up in the region known as the Fertile Crescent. Çatalhöyük, known as "man's first metropolis," had about 5,000 inhabitants, who lived in mud huts packed tightly together. They worshipped an obese mother goddess, depicted in statues as a figure sitting on a throne decorated with the heads of carnivores.

One of the most difficult challenges was the breeding and domestication of Middle Eastern wild cattle. The male specimens of the species weighed up to 1,000 kilograms (2,200 pounds) and had curved horns. People eventually drummed up the courage to approach the beasts somewhere in the central Euphrates Valley.

They found different ways of getting the cattle under control. One Neolithic sculpture depicts a steer with a hole punched through its nasal septum. Removing the testicles was also quickly recognized as a way of improving the animals' temperament. Once the wild cattle had been castrated, they could finally be yoked.

The clever farmers realized that if they gave calves from other mothers to the cows, their udders would always be full of milk.

### **No Taste for Milk**

Oddly enough, the Mesopotamian farmers didn't touch fresh milk. A few weeks ago, Joachim Burger returned from Turkey with a sack full of Neolithic bones from newly discovered cemeteries where the ancient farmers were buried.

When the bones were analyzed, there were no signs of lactose tolerance. "If these people had drunk milk, they would have felt sick," says Burger. This means that at first the farmers only consumed fermented milk products like kefir, yogurt and cheese, which contain very little lactose.

Even more astonishing, as recent excavations in Anatolia show, is the fact that the ancient farmers did not leave their core region for almost 2,000 years. They had put together the complete "Neolithic cultural package," from the rubbing stone to seeds, "without advancing into other areas," says archeologist Mehmet Özdoğan.

The coastal zones were long avoided. The people who lived there were probably fishermen who defended themselves against the new way of life with harpoons.

### **Renegade Settlers**

The crossing of the Bosphorus did not occur until sometime between 7000 and 6500 BC. The farmers met with little resistance from the hunter-gatherer cultures, whose coastal settlements were being inundated by devastating floods at the time. Melting glaciers had triggered a rise in the sea level of over 100 meters (160 feet).

Nevertheless, the advance across the Balkans was not a triumph. The colonists' dwellings there seem small and shabby. At the 47th parallel north, near Lake Balaton in modern-day Hungary, the advance came to a standstill for 500 years.

The Linear Pottery culture, which was the first to shift to the northern shore of Lake Balaton, gave the movement new life. Lüning talks about "renegade" settlers who had created a "new way of life" and a "reform project" on the other side of the lake.

With military determination, the advancing pioneers constantly established new settlements. The villages often consisted of three to six windowless longhouses, strictly

aligned to the northwest, next to livestock pens and masterfully constructed wells. Their tools, picks and bowls (which were basically hemispheric vessels) were almost identical throughout Central Europe, from Ukraine to the Rhine.

### **Migration and Mass Murder**

The settlers, wielding their sickles, kept moving farther and farther north, right into the territory of backward peoples. The newcomers were industrious and used to working hard in the fields. Clay statues show that the men were already wearing trousers and shaving. The women dyed their hair red and decorated it with snail shells. Both sexes wore caps, and the men also wore triangular hats.

By comparison, the more primitive existing inhabitants of the continent wore animal hides and lived in spartan huts. They looked on in bewilderment as the newcomers deforested their hunting grounds, tilled the soil and planted seeds. This apparently upset them and motivated them to resist the intruders.

In the Bible, Cain, the crop farmer, slays Abel the shepherd. In the Europe of the Neolithic Age, conditions may have been just as violent. One of the most gruesome discoveries is a mass grave that has been dubbed the "Talheim Death Pit" in the German town of that name. The pit is filled with the remains of 34 bodies. The members of an entire clan were apparently surprised in their sleep and beaten to death with clubs and hatchets. So far, archeologists haven't been able to figure out whether the incomers killed the existing inhabitants, or vice versa.

### **Drinking Milk by the Bucketful**

It is clear, however, that the dairy farmers won out in the end. During their migration, they encountered increasingly lush pastures, a paradise for their cows. An added benefit of migrating farther to the north was that raw milk lasted longer in the cooler climate.

This probably explains why people soon began drinking the abundant new beverage by the bucketful. Some had genetic mutations that enabled them to drink milk without getting sick. They were the true progenitors of the movement.

As a result of "accelerated evolution," says Burger, lactose tolerance was selected for on a large scale within the population in the space of about 100 generations. Europe became the land of the eternal infant as people began drinking milk their whole lives.

The new food was especially beneficial for children. In the Neolithic Age, many small children died after being weaned in their fourth year of life. "As a result of consuming healthy milk, this could be greatly reduced," Hamburg biologist Fritz Höffeler speculates. All of this led to population growth and, as a result, further geographical expansion.

### **'White Revolution'**

Does this explain why the inventors of the sickle and the plow conquered Europe so quickly, leading to the demise of the old hunter-gatherers?

Imagine, if you will, a village of the Linear Pottery culture in the middle of winter. As smoke emerges from the top of a wooden hut, the table inside is surrounded by rosy-cheeked children drinking hot milk with honey, which their mother has just prepared for them. It's an image that could help explain why people adopted a sedentary way of life.

Burger, at any rate, is convinced that milk played a major part in shaping history, just as gunpowder did much later. "There was once a white revolution," he says.

Translated from the German by Christopher Sultan

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