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Κάνιγγος 27, 106 82 Αθήνα
(Ενωση Ελλήνων Χημικών)

**ΔΙΟΙΚΗΤΙΚΟ
ΣΥΜΒΟΥΛΙΟ:**

Έ. Φώτου-Jones (πρόεδρος),
Ι. Μπασιάκος (αντιπρόεδρος),
Ι. Καρατάσιος (γραμματέας),
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Ε. Φιλιππάκη (βοηθός γραμ.),
Β. Κυλικογλου (μέλος),
Α. Hein (μέλος)

Πληροφορίες:

Γ. Φακορέλλης (σύνταξη,
επιλογή ύλης)

E-mail: yfacorel@teiath.gr

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

BOARD:

E. Photos-Jones (president),
J. Bassiakos (vice-president),
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V. Kilikoglou (member),
A. Hein (member)

Information: Y. Facorellis
(editor)

E-mail: yfacorel@teiath.gr

Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Μάρτιος 2012 -

“Do not spoil what you have by desiring what you have not; remember that what you now have was once among the things you only hoped for.”

(Epicurus, Greek philosopher, 341-270 BC)

Newsletter of the Hellenic Society of Archaeometry

- March 2012 -

Nr. 132

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ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

3^ο ΣΥΜΠΟΣΙΟ, ΑΡΧΑΙΟΛΟΓΙΚΗ ΈΡΕΥΝΑ ΚΑΙ ΝΕΕΣ ΤΕΧΝΟΛΟΓΙΕΣ ARCH RNT, ΤΜΗΜΑ ΙΣΤΟΡΙΑΣ, ΑΡΧΑΙΟΛΟΓΙΑΣ ΚΑΙ ΔΙΑΧΕΙΡΙΣΗΣ ΠΟΛΙΤΙΣΜΙΚΩΝ ΑΓΑΘΩΝ, ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΕΛΟΠΟΝΝΗΣΟΥ, ΚΑΛΑΜΑΤΑ, 3 – 6 ΟΚΤΩΒΡΙΟΥ, 2012

Το Συμπόσιο εστιάζει στην χρήση των *Νέων Τεχνολογιών* (Αρχαιομετρία, Υπολογιστικά Συστήματα, Συντήρηση και Αποκατάσταση) στην *Αρχαιολογική Έρευνα*, με έμφαση στην παρουσίαση ολοκληρωμένων διεπιστημονικών προσεγγίσεων, ειδικών εφαρμογών και πρωτότυπων μελετών σε αρχαιολογικά υλικά.

Ειδική Θεματική Συνεδρία: Εφαρμογές GIS στο πεδίο και στη διαχείριση της πολιτισμικής κληρονομιάς

Καλωσορίζοντας τη συμμετοχή σας!

Επιστημονική Επιτροπή

Σ.Μ Βαλαμώτη, Α. Βασιλογάμβρου, Ν. Γαλανίδου, J. Davis, Ε. Ζυμή, Γ. Θεοδώρου, Π. Θέμελης, Ε. Ιωακείμογλου, Ι. Κακουλλή, Α.Β. Καραπαναγιώτου, Π. Καρκάνας, Α. Καρύδας, Ν. Kiyak, Γ. Κίτης, Δ. Κοντοπούλου, Κ. Κωτσάκης, Ι. Λυριτζής, Α. Μαζαράκης-Αινιάν, Ν. Μαραβελάκη, Α. Μοροπούλου, Κ. Μπάικα, Μ. Ξανθοπούλου, Γ. Παναγιάρης, Γ. Παπαθεοδώρου, Α. Σαρρής, Μ. Σταματοπούλου, Ν. Τσιρλιγκάνης, Γ. Τσόκας, Ε. Φώτου-Jones

Οργανωτική Επιτροπή

Ν. Ζαχαριάς (Πρόεδρος), Μ. Καπαρού, Μ. Κυλάφη, Ε. Παλαμάρα, Μ. Παπαγεωργίου, Ν. Σούμας

Συνδιοργάνωση: *Δήμος Καλαμάτας*

Προκαταρκτικό Πρόγραμμα

Τετάρτη, 3 Οκτωβρίου

18:00 - 19:00 Εγγραφή Συνέδρων

20:00 – 22:00 Cocktail Υποδοχής Συνέδρων

Πέμπτη, 4 Οκτωβρίου

9:00 – 11:00 Συνεδρία Ι

11:00 – 11:30 καφέ

11:30 – 13:30 Συνεδρία ΙΙ

13:30 – 14:30 γεύμα

14:30 – 15:30 Συνεδρία Αφίσας Ι

15:30 – 17:00 Συνεδρία ΙΙΙ

17:00 – 17:30 καφέ
17:30 – 19:00 Συνεδρία IV

Παρασκευή, 5 Οκτωβρίου

9:00 – 11:00 Συνεδρία V
11:00 – 11:30 καφέ
11:30 – 13:30 Συνεδρία V1
13:30 – 14:30 γεύμα
14:30 – 15:30 Συνεδρία Αφίσας II
15:30 – 17:00 Συνεδρία VII
17:00 – 17:30 καφέ
17:30 – 19:00 Συνεδρία VIII
19:00 – 19:30 Κλείσιμο
20:00 Επίσημο Δείπνο Συμποσίου

Πέμπτη, 4 Οκτωβρίου 19:00–20:00 Ξενάγηση στο Αρχαιολογικό Μουσείο Μεσσηνίας

Σάββατο, 6 Οκτωβρίου 11:00–12:00 Ξενάγηση στον Αρχαιολογικό χώρο Α. Μεσσήνης

Εγγραφή: 60 ευρώ. Περιλαμβάνει τον φάκελο συνέδρου, διαλείμματα καφέ, γεύματα, ξεναγήσεις, έκδοση πρακτικών.

Διανυκτέρευση (προαιρετικά): **120 ευρώ** (3 νύχτες) σε ξενοδοχείο με πρωινό. Για περισσότερες πληροφορίες συμβουλευτείτε το αρχείο Έντυπο Εγγραφής.

Όποιος επιθυμεί να παρουσιάσει εργασία, πρέπει να υποβάλει ηλεκτρονικά περίληψη της εργασίας μέχρι την **1^η Αυγούστου**, χρησιμοποιώντας το σχετικό αρχείο το οποίο υπάρχει αναρτημένο στην ιστοσελίδα <http://kalamata.uop.gr/~Archaeolab>. Όλες οι περιλήψεις θα κριθούν από την Επιστημονική Επιτροπή. Κατόπιν αξιολόγησης και με βάση την ποιότητα και την πρωτοτυπία των εργασιών, θα παρουσιαστούν είτε ως ανακοινώσεις, είτε με τη μορφή αφίσας. Όλες οι εργασίες μπορούν να υποβληθούν για να συμπεριληφθούν, κατόπιν κρίσης, σε Τόμο των **Εκδόσεων του Πανεπιστημίου Πελοποννήσου**.

**3RD SYMPOSIUM ARCHAEOLOGICAL
RESEARCH AND NEW TECHNOLOGIES
ARCH RNT, DEPARTMENT OF HISTORY,
ARCHAEOLOGY AND CULTURAL
RESOURCES MANAGEMENT, UNIVERSITY
OF PELOPONNESE, KALAMATA (GREECE),
OCTOBER 3-6, 2012**

The Symposium focuses on the use of *New Technologies* (*Archaeometry, Computing Technology, Conservation and Restoration*) in the *Archaeological Research*, notably with the presentation of interdisciplinary approaches, special case studies and research of archaeological materials and assemblages.

Special Topic: GIS applications for field archaeology and cultural heritage management

Your participation and contribution are most welcome!

Scientific Committee

K. Baika, J. Davis, N. Galanidou, E. Ioakimoglou, I. Kakoulli, A.V. Karapanagiotou, P. Karkanias, A. Karydas, N. Kiyak, G. Kitis, D. Kontopoulou, K. Kotsakis, I. Liritzis, A. Mazarakis-Ainian, N. Maravelaki, A. Moropoulou, G. Panagiaris, G. Papatheodorou, E. Photos-Jones, A. Sarris, M. Stamatopoulou, G. Theodorou, P. Themelis, N. Tsirliganis, G. Tsokas, S.M. Valamoti, A. Vasilogamvrou, M. Xanthopoulou, E. Zimi

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N. Soumas, H. Topa, N. Zacharias (Chair)
Co-Organisation: *Kalamata Municipality*

Preliminary Program

Wednesday, 3 October

18:00 - 19:00 Registration

20:00 - 22:00 Welcome Reception

Thursday, 4 October

9:00 – 11:00 Session I

11:00 – 11:30 coffee

11:30 – 13:30 Session II

13:30 – 14:30 lunch

14:30 – 15:30 Poster Session I

15:30 – 17:00 Session III

17:00 – 17:30 coffee

17:30 – 19:00 Session IV

Friday, 5 October

9:00 – 11:00 Session V
11:00 – 11:30 coffee
11:30 – 13:30 Session VI
13:30 – 14:30 lunch
14:30 – 15:30 Poster Session II
15:30 – 17:00 Session VII
17:00 – 17:30 coffee
17:30 – 19:00 Session VIII
19:00 – 19:30 Closing
20:00 Symposium Dinner

Thursday, 4 October, 19:00-20:00 Archaeological Museum of Messinia Guided Tour

Saturday, 6 October, 11:00 – 13:00 Ancient Messene Guided Tour

Registration: 60 euros. Includes participant bag, coffee and lunch breaks, guided tours and proceedings publication accommodation (two nights)

Accommodation (optional): 120 euro (three nights with breakfast). .
For further information please visit the Registration Form

Information: Abstracts must be submitted electronically by **September 1st**, using the template given on the web page <http://kalamata.uop.gr/~Archaeolab>. All submissions will be reviewed by the members of the Scientific Committee. Presentations will be given either as oral or poster communications depending on the reviewers' decision based on quality and originality. All presentations will be eligible for publication in the Symposium's proceedings (**University of Peloponnese Press**) after having been peer-reviewed.

2ND LUMINESCENCE IN
ARCHAEOLOGY INTERNATIONAL
SYMPOSIUM L.A.I.S. 2012 LISBON,
GEOLUC, UCQR, INSTITUTO
TECNOLOGICO E NUCLEAR, EN10, 2686-
953 SACAVEM, PORTUGAL, 5TH - 7TH
OF SEPTEMBER, 2012

Exploration of the potentialities and limitations of luminescence and related analyses for materials and questions of archaeological and cultural heritage significance:

Technical foci:

- Context, Method and Phenomenon

Archaeological themes:

- Megaliths and megalithism

- Ceramics, glass and vitreous materials

- Reconstruction of environments in archaeological sites

<http://www.lais2012.itn.pt>

LAIS2012@itn.pt

IMPORTANT DATES

Submission of Abstracts – Until 30th March 2012

Early Payment of Registration Fee – Until 1st June 2012

LISBON INVITATION

The 2nd Luminescence in Archaeology International Symposium will be held in Lisbon, Portugal, from the 5th to the 7th of September, 2012. It will be hosted by the Group of Applied Geochemistry & Luminescence on Cultural Heritage (GeoLuC), Instituto Tecnológico e Nuclear (ITN), Sacavém, Portugal.

L.A.I.S. is an international initiative focussing on the use of luminescence for the dating and analysis of materials and questions of archaeological significance; in addition it supports archaeological and archaeometrical communities of the World to further develop and expose luminescence issues.

L.A.I.S. 2012 continues the series of symposia initiated in Delphi 2009, which focus on presentation and exploration of the potentialities and limitations of luminescence and related analyses, for materials and questions of archaeological and cultural heritage significance. L.A.I.S. Symposia aim at bringing together experts in the fields of luminescence, archaeology and archaeological materials from around the world for the exchange of knowledge.

Presentations are invited to focus on either contextual, methodological or phenomenological aspects of luminescence studies in archaeology and cultural heritage, including dating and material characterisation. For LAIS 2012 presentations are invited to address archaeological issues related to the following broad themes: megaliths and megalithism; ceramics, glass and vitreous materials; reconstruction of environments in archaeological sites.

Oral and poster presentations based on an integrated multidisciplinary approach are encouraged (i.e. co-authorship by luminescence specialists, archaeologists, archaeometrists, (geo)chemists, geomorphologists, geologists, palaeoenvironmentalists, physicists), as are applications for oral presentations by students.

Articles based on oral and poster presentations will be eligible for submission to a special issue of Mediterranean Archaeology and Archaeometry for peer reviewed publication.

C.I. Burbidge,
Inv.Aux.Contr. Fisica Aplicada,
GeoLuC, UCQR, ITN.

On behalf of
I. Liritzis
L.A.I.S. President

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G. Wagner, University of Heidelberg, Germany

SCOPE

Presentations will explore the analysis of archaeological and art-historical materials, natural materials contextualizing them or modern analogues, using luminescence signals. Sessions will be organised according to the following archaeological themes and technical foci:

Theme 1 - Megaliths and megalithism

Theme 2 - Ceramics, glass and vitreous materials

Theme 3 - Reconstruction of environments in archaeological sites

Focus 1 - Context

The focal issue will relate to the context in or to which the analyses are applied, and its implications for the methods and materials used. The context may be the physical archaeological remains, the theoretical/historical frameworks, or the organisational means for the work (e.g. “research or rescue”).

Focus 2 - Method

The focal issue will relate to the analytical methodology. Presentations may describe the testing, evaluation, refinement or development of techniques, methods or instrumentation, and implications for their archaeological application. The methods may be for luminescence, radiation, or (geo)chemical measurement; absorbed dose, dose-rate, or age estimation as a whole.

Focus 3 - Phenomenon

The focal issue will relate to the understanding of material characteristics and behaviours. Presentations may relate physical and (geo)chemical phenomena to archaeological realities, through controlled experimental studies and/or examination of theories or models of luminescence and dosimetric processes. Oral and poster presentations based on an integrated multidisciplinary approach are encouraged (i.e. co-authorship by luminescence specialists, archaeologists, archaeometrists, (geo)chemists, geomorphologists, geologists, palaeoenvironmentalists, physicists), as are applications for oral presentations by students. The objectives of presentations should be to define a problem and its relevance to the field of study, then describe how it is being addressed and indicate the impacts and potentialities of this work. Senior practitioners of luminescence methods in archaeology will present overviews of selected topics.

PROGRAM

Important dates

Deadline for abstract submission	30th March 2012
Communication of acceptance for oral/poster presentation	4th May 2012
Deadline for receipt of early registration payment	1st June 2012
Deadline for registration payment	5th September 2012

L.A.I.S . Conference
 Deadline for submission of manuscripts

5th - 7th September 2012
 1st October 2012

Conference timetable

An indicative conference program is shown below.

This may alter as a function of the nature of the submissions for presentation.

Wednesday 5th		Thursday 6th		Friday 7th		
09:00	Registration	Registration	Registration	President's address	Invited Speaker	Invited Speaker
Invited Speaker		Session 5		Session 7		
Session 1						
11:00			Coffee			
Session 2		Session 6		Session 8		
12:40			Lunch			
14:20	Session 3	Poster Session	Session 9			
Visit Sé-Catedral						
16:20		Coffee		Closing Ceremony		
Session 4			Visit Castelo São Jorge			
18:00						
Conference Dinner "Baleal"						

PETROGRAPHIC ANALYSIS FOR
CONSERVATION WORKSHOP
NATIONAL CONSERVATION TRAINING
CENTER (NCTC) SHEPHERDSTOWN,
WEST VIRGINIA MARCH 27-28, 2012

The National Center for Preservation Technology and Training (NCPTT) and The Center for Historic Architecture and Design (CHAD) in the University of Delaware's School for Public Policy and Administration are partnering to host a two-day hands-on workshop on the uses of polarized light microscopy for the study of stone and ceramic cultural materials. The workshop will be held March 27-28, 2012 at the National Conservation Training Center in Shepherdstown, West Virginia.

Polarized light microscopy of stone and ceramics, known as thin-section petrography, is a crucial tool for the study of ancient and historic objects and building materials. The technique is used to identify materials and their possible sources, understand production technology and object functions, study deterioration mechanisms, and assess preservation strategies and conservation treatments. However, specialized expertise is required to use this technique effectively. Preservation professionals, including conservation scientists, conservators, and archeologists, will benefit from this workshop. Students studying or interested in conservation are welcome.

The lead instructor for the workshop is Dr. Chandra L. Reedy, a professor in CHAD and director of the laboratory. The workshop builds on her 2008 book, *Thin-Section Petrography of Stone and Ceramic Cultural Materials*, with Archetype Publications, London.

(The book was the product of a successful Preservation Technology and Training Grant from NCPTT.). The workshop will begin with an introduction to polarized light microscopy as a method for identifying minerals. Subsequent sessions will focus on analysis of cultural materials made of stone (igneous, sedimentary, and metamorphic) and on pottery, terracotta sculptures, bricks, tiles, and clay core materials from bronze castings.

The workshop is open to 20 participants.
The cost of the workshop is \$299.

For more information contact Jason Church: jason_church@contractor.nps.gov

Registration is open through March 6, 2012 at [URL:http://ncptt.nps.gov/petrographic-analysis-for-conservation/](http://ncptt.nps.gov/petrographic-analysis-for-conservation/).

Participants are responsible for their own travel, housing, and meals. Participants are strongly urged to stay on-site at NCTC.

Workshop hotel costs, which include all meals, are \$129 per night for single room, plus tax.

Jason Church
Materials Conservator
National Center for Preservation Technology and Training
645 University Parkway
Natchitoches LA 71457
318-356-7444
Fax: 318-356-9119



'ANNIVERSARY' SPRING MEETING AND AGM. FURNACES, FOUNDRIES AND FORGES: IRONMAKING HERITAGE REVISITED BIRMINGHAM, ENGLAND: 25-26-27 MAY 2012

The ferrous industries were central to the origins of HMS in 1962-3, and fifty years later we return to the historical heart of the English iron industry to review progress in research, conservation and interpretation since then. This residential meeting will echo the focus of early HMS gatherings.

Site visits will include:

- Archaeological excavations and standing remains of blast furnaces, forges and other sites in Staffordshire, Worcestershire and Shropshire.
- Churchill Forge: rarely-open operational 18th and 19th century water-powered forge • excavation of early 19th-century hot blast furnace and refinery at Stirchley

Behind-the-scenes tours will include:

- Black Country Living Museum: with guided tour of the Keith Gale archive • Ironbridge Gorge Museum: with guided tour of HMS archives and the Slag Collections

Lectures will include:

- Medieval and later ironworking practice; origins and conservation of blast furnaces; new research into forges and puddling technology; hot blast and the cupola, and more.

Accommodation and lectures will be at the Woodbrooke Hall Quaker Study Centre, Bristol Road, Birmingham. Lectures will take place on Friday and Saturday evenings at Woodbrooke. Coach transport to sites will be provided on the Saturday and Sunday. The fully residential option (priced at £195.00 for HMS members) includes evening meals and overnight accommodation on Friday and Saturday, breakfast on Saturday and Sunday, packed lunches.

FULLY RESIDENTIAL PLACES ARE STRICTLY LIMITED, SO PLEASE BOOK EARLY

Download the Booking Form on the Historical Metallurgy Website <http://hist-met.org/agm2012.html>

Other options are available. These include a basic non-residential option at £35.00 for members, and an option with meals and other benefits at £75.00 for members. All options include coach transport and admission to sites. There will also be a limited number of FREE (non-residential) student places. It will of course be free for all members to attend the AGM, which will take place at 6pm on Saturday 26 May 2012 at Woodbrooke. The full range of options and prices is shown on the booking form. All bookings must be received by 29 February 2012.

More information is available on the conference website at <http://hmsanniversary.blogspot.com/> and our Facebook page (<http://www.facebook.com/profile.php?id=573775031&ref=mf#!/groups/36463147076/>). Or contact the organiser Paul Belford at paulbelford@ymail.com.

CALL FOR PAPERS: ORGANIC RESIDUE ANALYSIS IN ARCHAEOLOGY, AT THE ASOR ANNUAL MEETING, NOVEMBER 14-17, 2012 IN CHICAGO, ILLINOIS

Abstract: Organic residue analysis increasingly has been used as a means to answer archaeological questions about diet and cuisine, but also more recently, cult and crafts manufacture, that is to say, any activity that may have left behind traces of organic residue. In this session, papers will present a variety of methods for analyzing organic residues in archaeological contexts. Discussion will focus on critiquing different techniques and addressing present limitations and potential complications, as well as avenues for future research.

Questions about the session can be addressed to one of the co-chairs, listed below. Please note the deadline for submission of abstracts is February 15, 2012.

For information on the annual meeting, including registration and abstract submission go to:

<http://www.asor.org/am/call-for-papers.html>. Membership in ASOR is required to present at the meeting and registration for the meeting must be done together with abstract submission. Additional information about the annual meeting is available on the ASOR web site <http://www.asor.org/>.

Session Organizers:

Laura Mazow, Assistant Professor, East Carolina University, Department of Anthropology, mazowl@ecu.edu

Dr. Anthony Kennedy, Assistant Professor, East Carolina University, Department of Chemistry, kennedyan@ecu.edu

Susanne Grieve, Director of Conservation, East Carolina University, Department of History, grieves@ecu.edu

BRONZE AND IRON AGE **ARCHAEOLOGICAL MUSICOLOGY IN ANCIENT** **TURKEY, 16 – 20 OCTOBER 2012, BURSA,** **TURKEY**

Jointly organised by

The Research Center of Archaeology of the University of Uludağ, Bursa, Turkey,
and ICONEA

The conference will explore all aspects of music practice and theory in Ancient Turkey, through iconographic and textual materials, and other relevant media.

Languages and translation

The official language will be English. Papers in Turkish will be presented with an abstract in the English language. Only papers in those languages for presentation and publication of proceedings will be accepted.

Venues

The opening and conference sessions will be held in conference halls at the University Campus.

Presentations

Presentations will be limited to 30/45 minutes with an additional 20 minutes for questions. Guidelines for presentation and publication will be available from this page shortly.

Conference excursions

There will be a short visit of the city of Bursa and its Archaeological Museum; Hagia Sophia in Iznik, and Büyük Orhan Basilica. (Excursion programme may change.)

Registration and fees

To register, please request a form from: rdumbrill@iconea.org

Registration fees to be sent along with your registration form:

Non Turkish participants: 120 Euros, 80 Euros for retired, unwaged and students.
Payments to be sent to the following banking address:

IBAN: GB68NWBK60051418136958 / SWIFT: NWBKGB2L

You are advised to book your hotel accommodation as soon as possible. Click on the following link:

<http://www.holidayinnbursa.com/EN/2/0/hotel.html>

How to get there:

From Atatürk Airport to Bursa

Taxi or Shuttle to Yenikapı. Take the ferry to Mudanya (BURSA). It takes one and half hours from Yenikapı to Mudanya. From Mudanya take a bus to BURSA and Uludağ University (Bus 2/U).

It is advised to make a reservation for the Ferry to Bursa.

<http://www.ido.com.tr/en/index.cfm?page=SubPage&kapsam=175&textid=3091&ln=EN>

Shuttle to Yenikapı:

<http://www.ido.com.tr/en/index.cfm?page=SubPage&textid=2874&ln=en>

From Sabiha Gökçen Airport to Bursa

Takes a minibus to Bursa. They are to be found at the airport exit.

Take the AKMIŞ service <http://www.akmisseyahat.com/default.asp?slyfox=bursadonus>

<http://www.plazatur.com/tr-TR/?uID=8343ec94e2a14ec48025bcbf3cbbad0d467>

From the Bursa Bus Terminal, take another bus to the University of Uludağ University (93).

Please visit <http://www.iconea.org/>

2ND INTERNATIONAL CONFERENCE IN CHEMISTRY FOR CULTURAL HERITAGE, ISTANBUL, TURKEY, 9-12, JULY 2012

We are very happy to announce that the 2nd International Conference in Chemistry for Cultural Heritage, organized by Chemistry for Cultural Heritage, a working party of EuCheMS and Turkish Chemical Society will be held in Istanbul, Turkey, between 9-12, July 2012. The objective is to provide a universal scientific platform for the international scientific community not only of chemists, conservators and restorers but also for archaeologists, art historians, architects and museum scientists. Detailed information about the conference can be reached on our web page at www.chemch2012.org On behalf of the organizing committee, I would like to invite you to attend and contribute our conference with your scientific research.

Prof. Dr. Hadi Özbal, Conference Chair

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

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

Σας υπενθυμίζουμε την προκαθορισμένη συνάντηση της Εταιρείας την **Παρασκευή 2 Μαρτίου 2012** και **ώρα 18.00** στην μικρή Αίθουσα του Ισογείου του Εθνικού Ιδρύματος Ερευνών (Βασ. Κωνσταντίνου 48).

Έκτακτος ομιλητής θα είναι ο κ. **Γ. Λεκάκης** (Συγγραφέας/Λαογράφος) με θέμα «**Η Αγνώστη Μικρά Ασία**». Προσφάτως κυκλοφόρησε και η β' έκδοση του βιβλίου του «**Η Αγνώστη Μικρά Ασία**» από τις Εκδόσεις “Κάδμος”. Η ομιλία θα διαρκέσει άνω της μίας ώρας.

Η προγραμματισμένη ομιλία της Δρος Α. Λαούπη με θέμα «**Ηφαιστειακά Τοπία και Αρχαιολογία των Καταστροφών**» αναβάλλεται για τον επόμενο κύκλο ομιλιών λόγω εκτάκτων επαγγελματικών υποχρεώσεων της ομιλήτριας.

Με Φιλικούς Χαιρετισμούς,

Σταύρος Π. Παπαμαρινόπουλος
Πρόεδρος Ε.Μ.Α.Ε.Μ

Αλεξάνδρα Τσιρώνη
Γεν. Γραμματέας Ε.Μ.Α.Ε.Μ

2013 AIA ANNUAL MEETING, SEATTLE, **WASHINGTON, JANUARY 6-9, 2013,** **CALL FOR PAPERS**

The AIA is now accepting submissions for its 114th Annual Meeting, which will be held in Seattle, Washington, January 6-9, 2013. There are several new opportunities to present at the meeting and we encourage everyone to review the full Call for Papers (available at <http://www.archaeological.org/webinfo.php?page=10453>) prior to submitting.

Deadline for Submissions

As in past years, all organized sessions must be submitted by the first round of deadlines in March. Open session submissions may be submitted to meet either the March deadlines (if an early decision is needed to acquire a visa or obtain funding) or the second set of deadlines in August. The submission system will be open through August 17, 2009. If you expect to be in the field without Internet access you may submit your abstracts early, but you will not be notified of the PAMC's decision until late September.

First Deadline: Sunday, March 11, 2012 and Sunday, March 25 (with \$25 fee) Second Deadline: Sunday, August 5, 2012 and Sunday, August 19 (with \$25 fee)

New Session Types

The AIA is introducing several new session types for the 2013 Annual Meeting. Please see the Call for Papers for full details on each.

- Undergraduate Sessions: The AIA and Program for the Annual Meeting Committee have created two new, special sessions specifically for undergraduate students who would like an opportunity to present the results of their research at the Annual Meeting, but are not yet ready to participate in the regular program. At the 2013 Meeting there will be both an undergraduate colloquium for oral presentations, and an undergraduate poster session. These sessions will provide a fantastic opportunity for undergraduate students to experience the challenges and thrills of presenting at a professional meeting, and they will be held to the same high standards as other participants in the Annual Meeting.

- Lightning Session: This session is intended for brief five-minute presentations on a particular idea (e.g. for a research project, relating to one's dissertation, etc.) followed by five minutes of feedback from the audience and other participants. The session will be very low pressure and informal, but potentially very useful as a venue to float new ideas. The session will be held outside of the regular session blocks.

- Poster Colloquia: The AIA and the Program for the Annual Meeting Committee are for the first time soliciting poster colloquia.

A poster colloquium should be organized around a particular theme, just like a paper colloquium, and submitted at the same time as paper colloquia.

The full Call for Papers and submission instructions are available on the AIA website (www.archaeological.org/annualmeeting). Please review these instructions prior to submitting your abstract or session. All submissions must be made electronically by means of the online submission system via the AIA website. All submissions, of course, must pass the PAMC's vetting process to be put onto the program. The online submission forms and supporting documents are available on the AIA website.

View the 2013 Call for Papers:

<http://www.archaeological.org/webinfo.php?page=10453>

Online Submission Forms: <http://www.archaeological.org/webinfo.php?page=10193>

NARNIA TRAINING COURSE - INTRODUCTION TO THE ARCHAEOMETALLURGY OF CYPRUS

The Archaeological Research Unit of the University of Cyprus is pleased to announce a five-day training course on the Archaeometallurgy of Cyprus. This training activity is organised in the framework of the New Archaeological Research Network for Integrating Approaches to ancient material studies (NARNIA), a Marie Curie Initial Training Network, funded by the European Union.

One-hour lectures will be delivered by Prof. James Muhly, Prof. Bernard Knapp, Prof. Edgar Peltenburg, Prof. Thilo Rehren, Dr Vasiliki Kassianidou, Dr George Papasavvas, Dr Roger Doonan, Dr Anno Hein, Dr Myrto Georgakopoulou, Dr Erez Ben Yosef and Ms Maria Socratous, followed by excursions to copper mines and ancient metallurgical and archaeological sites around the island. The main objective of this training course is to provide a thorough introduction to the history and archaeology of ancient Cypriot metallurgy and metalwork from the prehistoric to Roman times, as well as the techniques used for the study of archaeometallurgical remains.

The course is open to interested researchers outside the NARNIA community and participation is free of charge. However, you are kindly requested to express your interest in participating in this course as soon as possible as places are limited and will be allocated on a first-come, first-served basis.

Additional information

Host Organisation: Archaeological Research Unit, University of Cyprus

Course coordinators: Vasiliki Kassianidou and George Papasavvas

Dates: 07-11 May, 2012

Location: Archaeological Research Unit, University of Cyprus, 12 Gladstonos Street, 1095 Nicosia, Cyprus
Open to the public: Yes No. of places available: max 30 participants

Fee: no fee

Contact person: Maria Dikomitou Eliadou, email: m.dikom@ucy.ac.cy

The detailed program for the training course will be announced on the NARNIA website <http://narnia-itn.eu/training-courses/> in due course.

Maria Dikomitou Eliadou

Project Manager

New Archaeological Research Network for Integrating Approaches to ancient material studies (NARNIA)

FP7 - PEOPLE - Marie Curie European Actions www.narnia-itn.eu Research Fellow
Archaeological Research Unit Department of History and Archaeology University of
Cyprus P.O.Box 20537 CY-1678 NICOSIA Cyprus
email: m.dikom@ucy.ac.cy
tel. +357-22-893573
fax: +357-22-674101

**CRETE IN THE ICE AGE: RECENT
EVIDENCE FOR VERY EARLY
MARINERS**
DR. THOMAS F. STRASSER AND
DR. ELENI PANAGOPOULOU

In 2008 The Plakias Mesolithic Survey began looking for pre-Neolithic remains in southwest Crete. No definitive evidence for the Mesolithic (9000-7000 B.C.) on the island had been found: a surprising fact in light of the Mesolithic sites reported from Cyprus, Kythnos and the Sporades. The survey employed a site-location model used successfully to identify Mesolithic sites in the Kandia region of the Argolid. It was a “directed survey,” neither intensive nor diachronic, but rather aimed at environments that Mesolithic peoples would have exploited and where their artifacts would be visibly preserved. The survey focused on fresh-water estuaries associated with south-facing limestone caves and steep bathymetric descents close to the modern shoreline. The areas of Plakias and Ayios Pavlos in the Rethymnon Nomos, on the southern coast, were chosen because they fulfilled those criteria.

Over 1600 stones tools were collected from ten Mesolithic sites with assemblages of microlithic artifacts of quartz and chert similar to known assemblages on the mainland. Of enormous importance for both Cretan prehistory and ancient sea faring was the discovery of Early Palaeolithic (ca. 1.6 mya to 250 kya) artifacts. These included quartz hand axes and cleavers. These were found in two important contexts: raised marine terraces (i.e., fossilized beaches) and Pleistocene terra rossas. By working with geologists we were able to establish a *terminus ante quem* that is not only well into the Pleistocene, but also earlier than 100,000 years ago.

In 2011, one of the Mesolithic sites near the village of Damnoni was chosen for excavation because of its soil preservation. The excavation found clearly stratified layers containing Mesolithic artifacts. This excavation has produced the first stratified Mesolithic cultural remains on Crete. The site is on a south-facing slope below a small cave and near freshwater streams. Test trenches were excavated to understand the stratigraphy, and they revealed three strata. The first consists of brown topsoil with a mixture of Mesolithic and later artifacts. An orange Aeolian deposit that contains most of the Mesolithic artifacts underlay this. The third stratum is a deep red paleosol; the upper level contained Mesolithic tools and probably formed the earliest living surface, but somewhat deeper it immediately became sterile of cultural remains. The chipped stone artifacts were predominantly made of local milky quartz, but there is also some chert. Presently micromorphological analysis and Optical Stimulated Luminescence dating is being conducted while the artifacts are studied. Now that one Mesolithic site has been successfully excavated, we hope that future research will expand upon this initial investigation.

Colin Macdonald
Honorary Research Fellow

School of History, Classics and Archaeology
University of Edinburgh

Please visit the site: WWW.MINOANSEMINAR.GR
<http://www.facebook.com/#!/groups/204679862041/>

**THIRD SPECIALIZATION FORUM "3D
VISUALIZATION FOR THE STUDY AND
MANAGEMENT OF COMPLEX
ARCHAEOLOGICAL SITES", JULY 2 - 7,
2012, HAINBURG, AUSTRIA**

OPENING CALL

Dear Colleagues,

We have the pleasure to announce the opening of the call for the Third Specialization Forum "3D visualization for the study and management of complex archaeological sites", organised in the framework of the European Radio-Past Project.

The Forum will take place from July 2 - 7, 2012, in Hainburg (Austria), near Carnuntum, a location that is appropriate for the focus on data interpretation and virtual reconstruction. Following the standards of the past two years, the teaching staff will again consist of academic and specialist lecturers from excellent European research institutes.

We kindly ask you to promote this event.

Further information can be found in the attached Call and the Registration Form, which both can also be downloaded from our website: <http://www.radiopast.eu>

Registrations have to be submitted before March 30, 2012, to:
cornelia.fischer@sapo.pt

Thank you very much.

Kind regards,

Cornelia Fischer and
The Radio-Past Team

C14 DATES FROM ASSIROS IN
MACEDONIA AND A NEW
CHRONOLOGY FOR THE END OF THE
GREEK BRONZE AGE

THE DIRECTOR OF THE BRITISH SCHOOL AT ATHENS
INVITES YOU TO AN UPPER HOUSE SEMINAR
MONDAY, 5TH MARCH, 2012 AT 7.00 P.M.

Dr Ken Wardle
(University of Birmingham)

will introduce the topic:

“C14 dates from Assiros in Macedonia and a new chronology for the end of the Greek
Bronze Age”

Vicki Tzavara
Assistant Secretary
British School at Athens
52 Souedias Street
Athens 106 76
Tel. +30 211 102 2801
Fax +30 211 102 2803
www.bsa.ac.uk

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –
JOB VACANCIES/FELLOWSHIPS

ASSOCIATE CONSERVATION
SCIENTIST - THE ART INSTITUTE OF
CHICAGO

THE ART INSTITUTE OF CHICAGO is seeking a qualified professional to join the Conservation Science Department

Reporting to the Senior Conservation Scientist, the Associate Conservation Scientist will work in close relationship with the Conservation Microscopist, Conservators and Curators to research, preserve and interpret objects in the collection. The incumbent should be able to work independently and will have primary responsibilities in organic materials characterization including operation and maintenance of Py-GC/MS equipment. The scientist is expected to actively contribute to research projects, scholarly publications and grant writing activities. The incumbent is also expected to ensure general lab. organization, provide analytical services and maintain record of analysis as well as write reports on completed projects.

ELIGIBILITY: The successful candidate should have a Ph.D. degree in one of the sciences with at least three years of experience in Museums or Cultural Heritage Institutions. Knowledge of advanced instrumental techniques for the characterization of artists' materials required (GC/MS, FTIR, XRF, Raman, SEM/EDX etc.). Previous experience in the scientific study of works of art, with a demonstrated history of independent research and publication relating to their preservation and technology required. Must have excellent verbal and written communications skills. Knowledge of one or more foreign language(s) desirable.

Additional Information: The Conservation Science facilities at the Art Institute of Chicago are equipped with state-of-the-art instrumentation: research microscopes (polarized light and reflectance/UV fluorescence); Raman and FTIR microspectroscopy, portable XRF spectrometry, Gas Chromatography/Mass Spectrometry, X-radiography and IR reflectography. In addition, the Museum has an ongoing collaborative program in conservation science with the Robert R. McCormick School of Engineering and Applied Science and the Chemistry Department at Northwestern University and with the Advanced Photon Source at Argonne National Lab, providing access to advanced research and analytical facilities and to faculty with a wide range of expertise in the physical sciences

Salary commensurate with experience, with benefits and a travel allowance. The start date is negotiable but preferably in the early Fall of 2012.

TO APPLY: Please submit a cover letter summarizing your interest and experience; curriculum vitae; and a concise statement describing your area(s) of research and its

potential relationship to the museum's collections using our on-line application at:
<https://csweb.artic.edu/recruit/applyjob.html>

In addition, three letters of recommendation (submitted independently by referees) and up to three copies of published papers should be sent to:

Joanne Kang
The Art Institute of Chicago
Human Resources
111 S. Michigan Ave
Chicago, IL 60603

Formal applications and supporting materials are due by April 15, 2012. Applications will be reviewed until the position is filled.

The Art Institute of Chicago is an equal opportunity, equal access employer fully committed to achieving a diverse workforce.



POSTDOC POSITION AT PSI **(SWITZERLAND)**

Dear list colleagues,

Please acknowledge the following job announcement (see also: <http://www.psi.ch/pa/offenstellen/0250-1>) and note that queries and applications should directly be sent to the project office at PSI.

Best regards,
Soenke Szidat
University of Bern

Postdoctoral Fellow **Analysis of organic compounds in alkaline media**

Your tasks

- Development of analytical techniques for the separation, identification and quantification of small organic compounds in alkaline solution based on liquid and gas chromatography for application in compound-specific C-14 analysis with accelerator mass spectrometry (AMS)
- LC/MS and GC/MS measurements on iron/water systems
- Participation in characterization studies of activated steel and the design of long-term corrosion experiments

Your profile

You should have a Ph.D. in chemistry with a focus on advanced analytical techniques (mass spectrometry and/or chromatography). You enjoy working in an interdisciplinary, multinational research environment. Good communication skills in English complete your profile. Knowledge of German is desirable. You should apply if you are a skilled experimentalist and a good team player motivated to ensure success in this exciting field of research.

For further information please contact Dr Erich Wieland, phone +41 56 310 22 91.

Please submit your application online (including list of publications and addresses of referees) for the position as Postdoctoral Fellow (index no. 4406-00).

Paul Scherrer Institut, Human Resources, Hedwig Habersaat, 5232 Villigen PSI, Switzerland

THE MAX PLANCK SOCIETY OFFERS THE POSITION OF TRACK LEADER IN PHYSICAL ANTHROPOLOGY TO LEAD A GROUP DEDICATED TO BONE AND TOOTH STRUCTURE-FUNCTION STUDIES

Within the frame of the collaborative activities of the
“Max Planck-Weizmann Institute Center in the field of Integrative Archaeology and Anthropology”

The Max Planck Society offers the position of **Track Leader in Physical Anthropology** to lead a group dedicated to
Bone and Tooth Structure-Function studies

The new group will be established in Leipzig and will work in close contact with the Department of Human Evolution of the Max Planck Institute for Evolutionary Anthropology (Director: Jean-Jacques Hublin) and with the Kimmel Center for Archaeological Science of the Weizmann Institute of Science (Director: Steve Weiner).

Applicants should have demonstrated outstanding research potential, leadership and clear evidence of achievement. The candidate should have expertise in modern bone and/or teeth biology, biomaterials and biomechanics and have knowledge in the field of physical anthropology. Experimental approaches and/or modeling capability are encouraged.

This is a fulltime research position. The salary will be at the W2 level on the German university scale, equivalent to an associate professor. Funds for conducting research, including salaries for post-doctoral scientists, PhD candidates and an administrative assistant are available. The appointment will be for a term of 5 years.

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

Applications should include a recent CV, a detailed research plan, and the names of three referees. Documents should be sent in pdf form to Diana Carstens carstens@eva.mpg.de and a hard copy must be received at the address below by **April 30, 2012**. The identities of applicants will be known only to those participating directly in the decision making process.

Max Planck Institute for Evolutionary Anthropology
Department of Human Evolution
Deutscher Platz 6
04103 Leipzig

Germany



**THE WEIZMANN INSTITUTE OF
SCIENCE OFFERS THE POSITION OF
TRACK LEADER IN ARCHAEOLOGICAL
SCIENCE TO LEAD A GROUP
DEDICATED TO THE TIMING OF
CULTURAL CHANGE**

Within the frame of the collaborative activities of the
“Max Planck-Weizmann Institute Center in the fields of Integrative Archaeology and Anthropology”

The Weizmann Institute of Science offers the position of **Track Leader in Archaeological Science** to lead a group dedicated to
The Timing of Cultural Change

The new group will be established in Rehovot, Israel and will work in close contact with the Kimmel Center for Archaeological Science at the Weizmann Institute of Science (Director: Steve Weiner) and with the Department of Human Evolution of the Max Planck Institute for Evolutionary Anthropology (Director: Jean-Jacques Hublin).

Applicants should have demonstrated outstanding research potential, leadership and clear evidence of achievement. The candidate should have expertise in radiocarbon dating, with a good understanding of archaeological materials and their preservation, and should be able to direct a major research program that starts in the field collecting samples in reliable contexts and ends with the radiocarbon dating of well-characterized samples.

This is a fulltime research position. The salary will be equivalent to an associate professor in Israel. Funds for conducting research including salaries for post-doctoral scientists, PhD candidates and an administrative assistant are available. The appointment will be for a term of 5 years.

Applications should include a recent CV, a detailed research plan, and the names of three referees. Documents should be send by e-mail in pdf form to Ms. Aline Ratley, office of the President the Weizmann Institute of Science aline.ratley@weizmann.ac.il by **April 30, 2012**. The identities of applicants will be known only to those participating directly in the decision making process.

QUEEN'S UNIVERSITY BELFAST,
LECTURERS IN ENVIRONMENTAL
CHANGE, SCHOOL OF GEOGRAPHY,
ARCHAEOLOGY AND
PALAEOECOLOGY

Ref: 12/101951

These posts are available to undertake research and teach in any aspect of the physical environment (including environmental science, physical geography, geomorphology, oceanography, climate modelling and related disciplines) which will complement, diversify or enhance research activities in the School of Geography, Archaeology and Palaeoecology. Information about the School may be obtained at www.qub.ac.uk/gap.

The School of Geography, Archaeology and Palaeoecology comprises three research clusters: Environmental Change, Past Cultural Change and Society, Space and Culture. In addition, the School hosts five research centres. The School supports internationally recognised research and education programmes (Geography, Archaeology and Palaeoecology) that tackle vital cultural, environmental and social concerns, past and present. The Environmental Change research cluster maintains an extensive array of equipment for field and laboratory research, including EA-IRMS for stable isotopes (C&N), X-ray diffraction, field x-ray fluorescence, laser scanners, geophysics (gamma-ray, resistivity, magnetometry, ground-penetrating radar), particle size analyser, ion chromatography, simulated weathering equipment, palaeoecological laboratories, core storage, a full range of light microscopes, access to SEM, and an AMS dedicated for radiocarbon-dating.

Salary scale: £32,901 - £48,246 per annum (including contribution points)

Closing date: Friday 16 March 2012

Please visit our website for further information and to apply online – www.qub.ac.uk/jobs or alternatively contact the Personnel Department, Queen's University Belfast, BT7 1NN. Telephone (028) 90973044 FAX: (028) 90971040 or e-mail on personnel@qub.ac.uk

The University is committed to equality of opportunity and to selection on merit. It therefore welcomes applications from all sections of society and particularly welcomes applications from people with a disability.

PHD POSITION GRADUATE SCHOOL **FOR THE HUMANITIES:** **ARCHAEOLOGY – AEGEAN** **PREHISTORY (0,9 FTE) (212041)**

Job description

The Graduate School for the Humanities offers 1 position to MA graduates in Archaeology with a specialisation in Aegean Prehistory. Candidates should submit a research proposal (max. 1500 words). Preference will be given to topics related to the Aegean Bronze Age, the Greek mainland, mortuary studies and the study of ritual, the archaeology of houses and households, or the history of Greek prehistoric archaeology. Candidates are expected to complete a PhD thesis within a four-year period. Candidates and their proposals will be judged on:

- individual research qualities of the candidate
- research and field experience
- originality of the research proposal
- quality of the proposed methodology incl. sources
- awareness of theoretical issues
- prospects of completion within 4 years.

Qualifications

- MA degree in Aegean Prehistory, or a related discipline
- strong motivation to complete a PhD thesis in four years
- proven affinity with chosen subject
- proven research abilities
- fluency in written and spoken English (TOEFL 620, IELTS 7,5, Cambridge Advanced CAE)
- knowledge of (or willingness to learn) Modern Greek.

Conditions of employment

The University of Groningen offers a salary of € 2,042 gross per month in the first year to € 2,612 gross per month in the fourth year (figures based on full employment). The appointment is temporary for a specified period of four years.

Affiliation

The PhD candidate will be affiliated with and enrolled in the research training program of the Graduate School for the Humanities. A staff-member of the Groningen Institute of Archaeology will be the principal supervisor ('promotor'). The position requires residence in Groningen, 36 hours/week research and research training, and must result in a PhD thesis. After the first year there will be an assessment of the candidate's results and the progress of the project to decide whether the employment will be continued.

How to apply

Please adhere to the guidelines of the GSH format for applications to write your application. See: <http://www.rug.nl/gradschoolHumanities/admissions/phdPositions>
Send us your entire application in just 1 pdf-file please + motivation letter in a separate

file. Incomplete dossiers will not be taken into consideration. Interviews with a selection of the best candidates will take place in the course of May.

Starting date of the PhD project: 1 September 2012.

You may apply for this position **before 1 April 2012**, 24:00 CET.

For practical information you can contact Ms M.R.B. Wubbolts, MA, Coordinator of GSH, phone +31 50 3637336, e-mail: m.r.b.wubbolts@rug.nl

Information

For information you can contact:

Prof D.J. Wolfram, Academic Director of the Graduate School of Humanities, +31 50 3637699, d.j.wolfram@rug.nl

Prof. S. Voutsaki, Professor of Greek Archaeology, +31 50 3636726, s.voutsaki@rug.nl

Additional information

[GIA](#)

[Information on the research institutes at the Faculty of Arts](#)

[Apply](#)

THE TIMES OF THEIR LIVES:
TOWARDS PRECISE NARRATIVES OF
CHANGE IN THE EUROPEAN
NEOLITHIC THROUGH FORMAL
CHRONOLOGICAL MODELLING

Dear All,

We are looking for an archaeologist with a strong background in the European Neolithic to work on this ERC-funded project. The contract is for 2 years and 10 months, and full details can be found at <http://www.cf.ac.uk/jobs/hisar/research-associate-5131.html>.

Best wishes,

Alex

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS
CULTURAL HERITAGE RESEARCH
MUST BE INCLUDED IN THE 8TH EU
FRAMEWORK PROGRAMME FOR
RESEARCH AND INNOVATION
(HORIZON 2020)

Dear Colleague,

In the proposal of the European Commission for the 8th EU Framework Programme for Research and Innovation, HORIZON 2020 cultural heritage has been omitted completely, thus taking away all the funds previously available for research in this field. This decision has serious consequences, since the whole basis for the conservation of cultural heritage in Europe will be eliminated, probably for many years to come.

Against this background, members of the Focus Areas Cultural Heritage (FACH) of the European Construction Technology Platform (ECTP) have taken action for an online petition to be addressed to the European Parliament and the European Council in order to plead strongly for the inclusion of cultural heritage research in HORIZON 2020.

In signing this petition, the cultural heritage research community requests the EU to acknowledge fully its responsibilities, now and in the future, to put cultural heritage research back high on its agenda and to address the topic appropriately in the next Framework Programme.

Please support this petition with your vote to ensure further promotion of cultural heritage research and also forward this link to your personal network:

http://www.ipetitions.com/petition/cultural-heritage-research_8th-framework-programme/

Thank you very much for your attention.

Kind regards

Paulo B. Lourenço on behalf of FACH
Professor
University of Minho, Portugal

INTERNET SITES

ΑΘΗΝΑ - ΕΡΕΥΝΗΤΙΚΟ ΚΕΝΤΡΟ ΚΑΙΝΟΤΟΜΙΑΣ ΣΤΙΣ ΤΕΧΝΟΛΟΓΙΕΣ ΤΗΣ ΠΛΗΡΟΦΟΡΙΑΣ, ΤΩΝ ΕΠΙΚΟΙΝΩΝΙΩΝ ΚΑΙ ΤΗΣ ΓΝΩΣΗΣ - ΙΝΣΤΙΤΟΥΤΟ ΠΟΛΙΤΙΣΤΙΚΗΣ ΚΑΙ ΕΚΠΑΙΔΕΥΤΙΚΗΣ ΤΕΧΝΟΛΟΓΙΑΣ

Το Ινστιτούτο Πολιτιστικής και Εκπαιδευτικής Τεχνολογίας (Ι.Π.Ε.Τ.) ιδρύθηκε το 1998 στην Ξάνθη. Λειτουργεί υπό την αιγίδα της Γενικής Γραμματείας Έρευνας και Τεχνολογίας (Υπουργείου Παιδείας, Δια Βίου Μάθησης και Θρησκευμάτων). Το Νοέμβριο του 2003 εντάχθηκε στο "Αθηνά" - Ερευνητικό Κέντρο Καινοτομίας στις Τεχνολογίες της Πληροφορίας, των Επικοινωνιών και της Γνώσης, που εδρεύει στην Αθήνα.

Σκοπός του Ι.Π.Ε.Τ. είναι η ενίσχυση ερευνητικών και τεχνολογικών δραστηριοτήτων και η εφαρμογή των νέων τεχνολογιών στους τομείς των ανθρωπιστικών επιστημών, του πολιτισμού και της εκπαίδευσης. Ειδικότερα, το Ι.Π.Ε.Τ. επικεντρώνει τις ερευνητικές του δραστηριότητες α) στην εφαρμογή των τεχνολογιών πληροφόρησης σε μελέτες κειμένων, αναλύσεις και καταγραφές γλώσσας, έργων τέχνης, μνημείων κ.τ.λ. β) στη μελέτη των σχετικών υλικών και ειδικότερα κεραμικών, του χάρτου και περγαμηνής και γ) στην εφαρμογή των τεχνολογιών πληροφόρησης στην εκπαίδευση και ειδικότερα στην μάθηση εξ αποστάσεως και στην παροχή εκπαίδευσης-κατά-ζήτηση.

Καθ. Χριστόδουλος Χαμζάς

Παρακαλώ επισκεφθείτε το δικτυακό τόπο: <http://www.ipet.gr/>

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

**THE COSMOS IN THE ANTIKYTHERA
MECHANISM, TONY FREETH AND
ALEXANDER JONES, ISAW PAPERS 4
(PREPRINT, 2/2012)**

is accessible via:

<http://ancientworldonline.blogspot.com/2012/02/isaw-papers-4-preprint-22012-cosmos-in.html>

-Chuck Jones-
ISAW - NYU

EΙΔΗΣΕΙΣ - NEWS RELEASE

UNDERWATER ARCHAEOLOGY: HUNT FOR THE ANCIENT MARINER ARMED WITH HIGH-TECH METHODS, RESEARCHERS ARE SCOURING THE AEGEAN SEA FOR THE WORLD'S OLDEST SHIPWRECKS

Brendan Foley peels his wetsuit to the waist and perches on the side of an inflatable boat as it skims across the sea just north of the island of Crete. At his feet are the dripping remains of a vase that moments earlier had been resting on the sea floor, its home for more than a millennium. "It's our best day so far," he says of his dive that morning. "We've discovered two ancient shipwrecks."

Foley, a marine archaeologist at the Woods Hole Oceanographic Institution in Massachusetts, and his colleagues at Greece's Ephorate of Underwater Antiquities in Athens have spent the day diving near the cliffs of the tiny island of Dia in the eastern Mediterranean. They have identified two clusters of pottery dating from the first century BC and fifth century AD. Together with other remains that the team has discovered on the island's submerged slopes, the pots reveal that for centuries Greek, Roman and Byzantine traders used Dia as a refuge during storms, when they couldn't safely reach Crete.

It is a nice archaeological discovery, but Foley was hoping for something much older. His four-week survey of the waters around Crete last October is part of a long-term effort to catalogue large numbers of ancient shipwrecks in the Aegean Sea. And the grand prize would be a wreck from one of the most influential and enigmatic cultures of the ancient world - the Minoans, who ruled these seas more than 3,000 years ago.

Some researchers believe that quest to be close to impossible. But Foley and a few competitors are using high-tech approaches such as autonomous robots and new search strategies that they say have a good chance of locating the most ancient of shipwrecks. If they succeed, they could transform archaeologists' understanding of a crucial period in human history, when ancient mariners first ventured long distances across the sea.

Archaeologists have precious little information about the seagoing habits of the Minoan civilization, which erected the palace of Knossos on Crete - linked to the Greek myth of the Minotaur. Minoans far exceeded their neighbours in weaponry, literacy and art, and formed "part of the roots of what went on to become European civilization", says Don Evely, an archaeologist at the British School at Athens, and curator of Knossos. Archaeologists are keen to understand what made the Minoans so successful and how they interacted with nearby cultures such as the Egyptians.

Although researchers have studied scores of Roman ships, finding a much older Minoan wreck "would add 100% new knowledge", says Shelley Wachsmann, an expert in ancient seafaring at Texas A&M University in College Station.

Underwater treasure

A Bronze Age wreck called Ulu Burun shows how the remains of a single ship can transform archaeologists' understanding of an era. Discovered in 1982, it lies about 9 kilometres southeast of Kaş in southern Turkey, and dates from around 1300 BC, a century or two after the Minoans disappeared.

Christos Agourides, secretary-general of the Hellenic Institute of Marine Archaeology in Athens, describes it as "the dream of every marine archaeologist". It took ten years to excavate, and researchers are still studying the nearly 17 tonnes of treasures recovered. The vast cargo includes ebony, ivory, ostrich eggs, resin, spices, weapons, jewellery and textiles as well as ingots of copper, tin and glass.

But what really stunned archaeologists was that the artefacts on this one vessel came from at least 11 different cultures¹ - from a gold scarab bearing the name of the Egyptian queen Nefertiti to copper from Cyprus and tin from central Asia.

The wreck provided tangible evidence of an astonishing array of contacts and trade between the different cultures of the Mediterranean and Near East in the late Bronze Age. The Ulu Burun ship sailed at around the time that Tutankhamun ruled Egypt, and "it is far more important than Tutankhamun's tomb as a contribution to our understanding of the period", according to Wachsmann. "This goes to the nitty gritty of the world. It's Wall Street in a ship."

The earlier Minoans set the stage for such a widespread trading network through their domination of the eastern Mediterranean. Their seafaring abilities were still celebrated 1,000 years later by Greek historian Thucydides, who credited the Minoans with building the world's first navy and ridding the seas of pirates. Although other contemporary Mediterranean cultures were starting to travel across the sea, the Minoans ventured farther than others, reaching distant ports in Syria, Cyprus, the Cyclades and Egypt (see map). Wachsmann describes them as the "Christopher Columbuses of the Bronze Age".

Researchers have already found one potential Minoan wreck site by the island of Pseira, off the northeast coast of Crete. In 2003, archaeologist Elpida Hatzidaki of the Ephorate of Underwater Antiquities discovered a large collection of underwater pottery dating to around 1800 BC.

But at this site and a few even older ones, no portion of the ship itself survives, and it is hard to determine whether the pottery came from a wreck, was simply thrown overboard, or washed into the sea from the nearby coast. Even those who believe the Pseira site does represent a Minoan wreck admit that the pottery itself - everyday ware of local origin - doesn't reveal much new information. What archaeologists crave is an equivalent of Ulu Burun, a long-distance trading ship packed with valuable cargo that would reveal how different cultures interacted. "Ships were the way that people communicated and moved about the ancient world," says Foley. "So if we can find these ancient wrecks, we get a much clearer view of the very dim past."

That dream lured Foley and his team to Crete last year, and they brought a new tool that they hope will significantly raise the chances of finding an ancient shipwreck. In the past, archaeologists have explored the sea floor using divers and, more recently, remotely operated vehicles (ROVs) that are controlled by pilots on ship.

Foley's team tested an autonomous diving robot that could search the ocean bottom for hours under its own command. The REMUS 100 vehicle (for Remote Environmental

Monitoring Underwater System) is equipped with Global Positioning System technology, side-scan sonar and a video camera. The Woods Hole researchers worked on the project with Greek archaeologists led by Theotokis Theodoulou of the Ephorate of Underwater Antiquities.

The torpedo-shaped robot, nicknamed Gudgeon after a Second World War submarine, spent the first month of the field campaign surveying the entire sea floor north of Crete's main harbour, Heraklion, for any lumps and bumps that might signal an ancient wreck.

Foley had high hopes for the area because it had been a port for millennia and had never been surveyed by archaeologists. But the search came up empty handed. Close to shore, there was no hope of finding ancient wrecks because the sea floor was covered in a thick pile of sediments that had washed off the island. Farther out, the researchers found furrows left by trawl fishermen, who had scraped the sea floor clean, even in areas where trawling is supposedly forbidden.

So Foley's team moved its search to Dia, which lies just north of Heraklion. In 1976, the ocean explorer Jacques Cousteau found some ancient remains there, and Foley suspected that Dia might be a fertile site for shipwrecks because its steep cliffs could be lethal to vessels caught in a storm.

The team took a two-pronged approach to exploring around Dia. The Gudgeon crew prowled Dia's bays, where the ocean bottom is smooth and artefacts are more likely to show up in sonar images. Near shore, where the bottom is too rocky for Gudgeon, Foley and his team of divers made a circuit of the bays at about 40 metres depth.

Almost immediately, the divers located five ancient wrecks, ranging from around the second century BC to the ninth century AD. The discoveries confirmed Cousteau's impression that now-deserted Dia was used for centuries as an anchorage. And Foley was convinced that the Minoans must have been here too, with the evidence perhaps on the deeper floor of Dia's bays. But Gudgeon's sonar images from those sites kept coming back disappointingly clear.

On the penultimate day of the field season, Greg Packard and Mark Dennett of Woods Hole stood on the stern of their small research vessel, and swung Gudgeon overboard. The miniature explorer descended to the bottom and spent the morning cruising back and forth along preprogrammed gridlines. Later that evening, when Packard examined the sonar data, he spied a potential target - a patch of bright speckles amid the smooth dark image. The team debated whether it could be a heap of pottery on the sand.

The next day, Foley took his crew of divers out to the suspect site. Some 15 minutes later, they came back with disheartening news: the sonar signal was a collection of plastic water bottles that must have been dumped overboard from a modern boat. And footage from Gudgeon's video camera explained the absence of archaeological remains - furrows in the sand showed that trawlers had cleaned out even these tiny bays. If a Minoan ship ever sank here, it has long since been destroyed. "It's such a waste," says Foley, clearly disappointed. "I bet they're not even trawling for fish. I bet they're trawling for antiquities."

Diving deeper

Wachsmann says that he isn't surprised by what Foley saw. From 2007 to 2009, he led the Danaos project, using sonar-equipped ROVs to survey hundreds of square kilometres of sea floor on a suspected ancient trading route between Crete and Egypt. In three seasons, he didn't find a single ancient wreck from any period, and only a scattering of artefacts.

Wachsmann found that sedimentation was a problem even far from shore - up to a metre per millennium in some areas. This means that although some Greek and Roman remains might still be visible, a Minoan ship would be buried under 3 or 4 metres of sand. And even at 500-600 metres depth, he saw clear evidence of trawling. "It was almost like somebody had swept the sea in front of me," he says. On the basis of his experiences, Wachsmann now believes that the chance of finding a Minoan equivalent of Ulu Burun "approaches zero".

The effect of bottom trawling is "devastating" for archaeologists, agrees Robert Ballard, an oceanographer based at the University of Rhode Island in Narragansett, who has pioneered deep-sea exploration and discovered the wreck of the Titanic in 1985. "Most of the Aegean has been destroyed," he says.

Ballard has spent years searching for ancient wrecks and says that he has learned the importance of finding areas beyond the reach of fishermen - below about 600 metres, say, or close to undersea cables, which trawlers avoid. He has also opened up his search area.

Historians once assumed that the number of wrecks in the deep sea was negligible because ancient ships must have hugged the coastlines, but in the 1990s Ballard found eight ancient wrecks far from shore between the islands of Sicily and Sardinia² (Foley was Ballard's graduate student at the time). "The ancient mariner was not afraid of going out to sea," says Ballard.

Since 2008, Ballard has been exploring the eastern Mediterranean, the Aegean and the Black Sea with a suite of ROVs. Although he is finding large numbers of ancient wrecks, he hasn't yet uncovered anything from the Bronze Age. But, like Foley, he believes Minoan ships are waiting to be discovered. The key to finding the oldest wrecks, he says, is locating "relic surfaces" that have escaped being buried by sediment, which flows downhill and covers the deep sea floor³. "What you want is a shipwreck that came down on a mountain," he says, because sediment can't accumulate on a steep slope.

Last year, Ballard investigated the Eratosthenes seamount, a 700-metre-deep tabletop south of Cyprus, and says it does indeed seem to represent a relic surface. He is now applying for permits to return to Eratosthenes to search for shipwrecks next year. Another area he would like to investigate is the submerged Anaximander mountains south of Turkey. It would be difficult to distinguish a wreck site from such rocky terrain using sonar, so he plans to use video cameras to conduct a painstaking visual search over smaller areas. "It's very hard hunting," he says.

Foley is also now looking to the deep sea, but has a different strategy. Instead of targeting particular sweet spots, he wants to cover as large an area as possible. He has raised more than US\$1 million towards the \$1.8 million that he needs to return to the Mediterranean next year, this time with two of Gudgeon's more powerful cousins, REMUS 6000s owned by the Waitt Institute in La Jolla, California.

To maximize the chances of finding ancient wrecks, the team will hunt on open, flat areas in the lowest reaches of the sea, up to 6,000 metres deep. Foley estimates that the two REMUS vehicles can cover up to 5,000 square kilometres in one month, equivalent to 1% of the entire Aegean Sea. The recent field trial around Dia encouraged Foley because it should be easier for the sonar surveys to pick out vases than it was to find plastic water bottles, which are poor sonar reflectors, he says.

Both Ballard and Foley are ultimately hoping to use their surveys to catalogue large numbers of wrecks of all ages across great swathes of the Mediterranean and the Black Sea. Through a combination of sonar and high-resolution digital photography, they can compile detailed three-dimensional maps of a wreck site and answer questions about the date, origin and cargo of a ship without bringing up a single artefact.

Foley estimates that hundreds of thousands of ships must have sunk in ancient times - including thousands in the Bronze Age alone - and that a significant proportion of those are still sitting at the bottom of the deep sea. If he's right, then perhaps researchers will eventually have not just one Minoan ship, but hundreds. With enough wrecks, says Foley, "it ought to allow us to draw new conclusions about this absolutely formative period in human experience."

That could shift marine archaeologists into an era in which they can use statistical data gathered from hundreds or thousands of wrecks to build up a bigger picture of trade routes, migration and warfare throughout history. "We'd rather find 500 ships than excavate one," says Ballard.

Such a dream seems a long way off as Foley's team packs up its gear at the end of its campaign. Packard and Dennett carefully lower Gudgeon into a crate for its long trip back to Woods Hole, while Foley eyes one of the artefacts he retrieved from Dia's waters - a bulbous Byzantine amphora covered in deposits left by worms.

It's not the find Foley hoped for, but he is undaunted - this is just the beginning of what he knows could be a long search. "I'd like to be doing this every year for the next 20 or 30 years," he says. "Until I'm too old to go to sea."

Nature 481, 426-428 (26 January 2012) doi:10.1038/481426a References

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Please visit the site: <http://www.nature.com/news/underwater-archaeology-hunt-for-the-ancient-mariner-1.9880>

ΕΝΑΣ ΝΕΟΛΙΘΙΚΟΣ ΟΙΚΙΣΜΟΣ ΤΗΣ 8^{ης} **ΧΙΛΙΕΤΙΑΣ π. Χ. ΜΕ ΔΙΩΡΟΦΑ ΚΤΗΡΙΑ** **ΚΑΙ ΣΥΜΒΟΛΙΚΟΥΣ ΧΩΡΟΥΣ ΣΤΟ** **ΣΑΦΙ ΤΗΣ ΙΟΡΔΑΝΙΑΣ**

Από το 2007 το Πανεπιστήμιο Αιγαίου διενεργεί υπό τη διεύθυνση του καθηγητή Αδαμαντίου Σάμψων σημαντική ανασκαφή στην περιοχή Σάφι της Ιορδανίας. Η θέση (31.016 783 Latid. 35. 542 582 Long.) βρίσκεται πάνω σε εκτεταμένο πλατώ κοντά στη συμβολή των ποταμών Wadi el Hasa και Wadi Hamarash. Το πλατώ είναι γυμνό από βλάστηση και ορίζεται από το Wadi Hamarash στα ανατολικά και ένα μικρότερο ρέμα στα δυτικά, ενώ στα βόρεια κλείνεται από απότομα βουνά. Η θέση είναι απομονωμένη και δύσβατη και απέχει 8 ώρες με τα πόδια από το χωριό Taybah που βρίσκεται ψηλά στο ιορδανικό πλατώ και 2-3 ώρες από το χωριό Safi στο επίπεδο της Νεκράς Θάλασσας. Δεν υπάρχει αμαξιτός δρόμος και η πρόσβαση στο χώρο, η διαμονή καθώς και η μεταφορά του εξοπλισμού της ανασκαφής και των τροφίμων παρουσιάζει μύριες δυσκολίες. Πρόκειται για δυσκολότατο εγχείρημα που μάλιστα πραγματοποιείται εν καιρώ χειμώνα.

Ο νεολιθικός οικισμός καταλαμβάνει σχετικά μικρό μέρος του πλατώματος και έχει έκταση 4-5 στρεμμάτων. Αρχικά ένα πυκνό δίκτυο τοίχων ανασκαφής στον τομέα I που έχει έκταση 220 τ.μ. και βρίσκεται στο ΒΔ άκρο του οικισμού. Μερικοί τοίχοι ήταν παχείς και καλοχτισμένοι και πιθανώς ανήκαν σε ψηλά κτήρια, ενώ άλλοι ήταν λεπτοί και αποτελούσαν χωρίσματα μεταξύ δωματίων. Συνολικά ερευνήθηκαν 26 δωμάτια ή αποθηκευτικοί χώροι (loci) οι οποίοι σπάνια ήταν ορθογώνιοι, ενώ συνήθως είχαν σχήμα τραπεζοειδές. Τρία κτήρια ερευνήθηκαν μέχρι το παρθένο έδαφος και αποδείχθη ότι είχαν δύο ορόφους. Η αφαίρεση της επίχωσης όλων των δωματίων απέδωσε πλήθος μυλόλιθων και τριπτήρων από ψαμμίτη. Σημαντικό εύρημα ήταν μία κεφαλή γυναίκας ύψ. 0,10 μ. από ψαμμίτη που έχει υποστεί φθορά στη μύτη και στο πηγούνι.

Ο τομέας II στη νότια πλευρά του οικισμού ανασκαφής σε έκταση 270 τ.μ. Αρχικά στο χώρο ήταν ορατό ορθογώνιο κτίσμα (χώρος 1) που είχε εν μέρει ανασκαφεί από λαθροανασκαφείς. Το κτήριο έφερε ισχυρούς τοίχους με μεγάλες πέτρες και στις τρεις τουλάχιστον πλευρές του παρουσίαζε σε βάθ. 0,63 μ. «πατούρα» πλάτους 0,20 μ. η οποία πιθανώς χρησίμευε για να πατούν τα δοκάρια του α' ορόφου. Γύρω από το κύριο κτήριο υπήρχαν μικροί χώροι ή δωμάτια που είχαν σχέση μ' αυτό. Η ανασκαφή τους μέχρι βάθους 30 εκ. απέδωσε πολλούς μυλόλιθους, τριπτήρες και λεπίδες από πυριτόλιθο. Συνολικά ανασκάφηκαν 25 χώροι εκ των οποίων οι πέντε αποτελούνται από αρκετά μεγάλα δωμάτια. Ένας χώρος ήταν διώροφος και επικοινωνούσε με ένα ισόγειο δωμάτιο. Ο σπουδαιότερος χώρος ήταν ένα δωμάτιο ισόγειο με δάπεδο από ασβεστοκονίαμα που επεκτεινόταν και στους τοίχους και έφερε ανοιχτό μπλε χρώμα. Λίθινα σκεύη και τμήμα κρανίου με κέρατα γαζέλας στο δάπεδό του καθώς και δύο χτιστά θρανία πιθανώς φανερώνουν ένα χώρο με κάποια συμβολική χρήση.

Ανατολικά του τομέα II ανασκαφής ο τομέας III με διαστάσεις 16 x 10 μ. Βρέθηκε ανοιχτός χώρος που πιθανώς αποτελούσε αυλή ενώ ανατολικά και δυτικά είχαν δημιουργηθεί μικροί χώροι προφανώς αποθηκευτικοί που επικοινωνούσαν μεταξύ τους

με στενές πόρτες. Στην κεντρική αυλή κατέληγε στενός διάδρομος πλάτους 1μ. που πιθανότατα αποτελούσε ένα δρόμο. Στη ΝΑ πλευρά του τομέα ΙΙΙ ανεσκάφη κτήριο με δύο ορόφους.

Το 2011 ερευνήθηκε ένα άλλο τμήμα του οικισμού στη ΝΔ πλευρά του. Ο τομέας V διαστάσεων 22 x 18 μ. που απέδωσε 35 μικρούς και μεγάλους χώρους, που χωρίζονταν στα δύο από ένα αρκετά ευρύχωρο δρόμο με διεύθυνση Β-Ν ο οποίος στη συνέχεια κατευθυνόταν προς τα ανατολικά. Στη βόρεια πλευρά υπάρχει πυκνοχτισμένο τμήμα με μέτρια σε διαστάσεις δωμάτια και πολύ μικρούς χώρους πιθανότατα αποθηκευτικούς. Μεγαλύτερο ενδιαφέρον έχει το πλακόστρωτο δωμάτιο που έφερε ασβεστοκονίαμα στο δάπεδο και πιθανώς και στους τοίχους οι οποίοι σώζονται σε μικρό ύψος. Τρεις μικροί χώροι όπως τα Loci 2,5 και 7 ανασκάφηκαν σε αρκετό βάθος και παρουσίασαν ιδιαίτερα ευρήματα μέσα σε παχιά στρώματα καύσης ενώ στους περισσότερους χώρους η ανασκαφή δεν προχώρησε σε μεγάλο βάθος.

Αυτό που παρουσιάζει το μεγαλύτερο ενδιαφέρον στον οικισμό είναι ένα μεγάλο ισόγειο τετράπλευρο κτήριο στον τομέα IV που εμφανίζεται για πρώτη φορά στο χώρο της Εγγύς Ανατολής στην περίοδο της Νεολιθικής Προκεραμικής Β. Το κτήριο έχει εξωτερικές διαστάσεις 10,60 x 9,50 μ. και δεν τηρεί τον προσανατολισμό που έχουν συνήθως τα άλλα κτήρια του οικισμού. Πρόκειται για ανεξάρτητο κτήριο που δεν έχει καμία σχέση με την πυκνή δόμηση των άλλων κτισμάτων, ενώ στη δυτική του πλευρά ανοίγεται ευρύχωρη πλατεία που δεν είχε οικοδομηθεί. Η τοιχοδομία του κτηρίου ιδίως στην εξωτερική πλευρά είναι εξαιρετική και αποτελείται από πλακοειδείς πέτρες αρμοσμένες με μεγάλη επιμέλεια. Στη νότια πλευρά το θεμέλιο του τοίχου φτάνει σε βάθος 1,65 μ., ενώ στη βόρεια πλευρά η θεμελίωση του τοίχου βρίσκεται πολύ ψηλά.

Δεν υπάρχει απόλυτη συμμετρία στις διαστάσεις και ενώ πρόκειται για ορθογώνιο ή περίπου τετράγωνο κτίσμα στην πραγματικότητα είναι αρκετά παράγωνο. Εκατοντάδες πέτρες από την τοιχοδομία βρέθηκαν μέσα στο κτήριο και έξω από αυτό και δείχνουν ότι οι τοίχοι είχαν ικανό ύψος. Υπάρχουν δύο κύριες πόρτες στο κτήριο μία στη δυτική πλευρά και μία στην ΝΔ γωνία, πλάτους 0,95 και 0,90 μ. αντίστοιχα. Και οι δύο φέρουν λίθινα κατώφλια. Τρία στενά ανοίγματα βρίσκονται σε μικρή απόσταση μεταξύ τους στη δυτική πλευρά.

Στο εσωτερικό οι τοίχοι φέρουν εσοχές για την υποδοχή ξύλινων πασσάλων ανόμοιου πάχους. Υπάρχουν 9 παρόμοιες κόγχες που εκτός από δύο οι άλλες δεν παρουσιάζουν συμμετρία. Χαρακτηριστικό είναι ότι οι κόγχες φαρδαίνουν προς τα μέσα για να συγκρατούν καλύτερα τους ξύλινους πασσάλους. Προφανώς η στέγη ήταν ξύλινη ίσως δικλινής και στηριζόταν σε πολλούς πασσάλους προκειμένου να καλυφθεί το μεγάλο άνοιγμα του κτηρίου που φτάνει τα 10 μέτρα.

Το δάπεδο βρέθηκε σε μικρό σχετικά βάθος (0,75 μ.) στη νότια και δυτική πλευρά ενώ στη βόρεια λόγω καθίζησης βρέθηκε χαμηλότερα και ήταν πολύ κατεστραμμένο. Η κατασκευή του ήταν επιμελημένη και περιλάμβανε τρεις φάσεις. Αρχικά ο χώρος στρώνονταν με μεγάλες πλάκες και σκληρό χώμα. Στην συνέχεια, τοποθετούνταν μικρά χαλίκια από πάνω, αναμεμειγμένα με χώμα, και τέλος πάνω σ' αυτά έμπαινε λευκό κονίαμα. Δυστυχώς το ασβεστοκονίαμα σώθηκε σε λίγα σημεία ενώ σε μεγαλύτερη έκταση υπήρχε το στρώμα χαλικιών. Σε πολύ λίγες περιπτώσεις σώθηκε το κονίαμα των τοίχων.

Χαρακτηριστικό είναι ότι μέσα στην επίκωση του κτηρίου υπήρχαν ελάχιστα ευρήματα και αυτά όχι στο ύψος του δαπέδου. Πρόκειται για μερικούς τριπτήρες και θραύσματα λεπίδων. Στη ΒΔ πλευρά στο τετρ. 62 εμφανίστηκε μεγάλο λίθινο αγγείο με ένα είδος προχοής και διάμετρο 0,43 μ, σε βάθος 0,40 μ, το οποίο πατούσε πάνω στο δάπεδο. Στο ίδιο επίπεδο 0,40 μ. βρέθηκαν επίσης 2 ορθογώνιοι τριπτήρες και εμφανίστηκε στρώμα στάχτης,

Η μόνη κατασκευή μέσα στο κτήριο ήταν ορθογώνια εστία διαστάσεων 1,00 x 0,80 μ. στο τετράγωνο 24 που παρουσιάζει ασυμμετρία σε σχέση με τους τοίχους. Πλησίον της εστίας αποκαλύφθηκε κυκλικό λάξευμα στο ύψος του δαπέδου που έφερε περιφερειακά μικρές πέτρες και περιείχε σφαιρικό λίθο διαμ. 0,43 και ύψ. 0,35 μ. Στη μια πλευρά της πέτρας υπήρχαν δύο όμοια εγχάρακτα σύμβολα που μοιάζουν περίπου με το γράμμα Ψ. Αξίζει να σημειωθεί ότι είναι η πρώτη φορά που εμφανίζονται εγχάρακτα σύμβολα στη φάση της ΠΝ Β.

ΣΥΜΠΕΡΑΣΜΑΤΑ

Η ανασκαφή συνεχίζεται και μέχρι τώρα έχει ανασκαφεί έκταση 1600 τ. μ. Πρόκειται για μικρό οικισμό σε σχέση με άλλους μεγάλους οικισμούς έκτασης εκατοντάδων στρεμμάτων (megasites) που έχουν ανασκαφεί στη νότια Ιορδανία (Basta, Beidha, Ba'ja). Η αρχιτεκτονική του δεν διαφέρει από αυτήν των άλλων γνωστών οικισμών της ΠΝ Β και είναι συνδυασμός διώροφων και ισόγειων κτηρίων με δωμάτια που επικοινωνούν με εσωτερικές πόρτες και παράθυρα (Pueblo style). Δεν υπάρχουν πόρτες προς τα έξω και η είσοδος στα δωμάτια γινόταν από τις επίπεδες οροφές, πρακτική που συνηθίζεται και σε οικισμούς της Ανατολίας (Catal Höyük). Οι χρονολογίες με ραδιοάνθρακα δείχνουν σύντομη περίοδο κατοίκησης μεταξύ 7800-7600 π.Χ., ενώ το μικρό μέγεθος του οικισμού και η τεχνολογία των λίθινων εργαλείων τοποθετούν το Wadi Hamarash στο πρώιμο στάδιο της ΠΝ Β.

Η ανασκαφή του μεγάλου ορθογώνιου κτηρίου το οποίο ξεχωρίζει από τα άλλα κτίσματα και βρίσκεται σε περίοπτη θέση στο βόρειο άκρο του οικισμού αποτελεί κάτι πρωτόγνωρο για την PPNB της Ιορδανίας. Το κτήριο διαφέρει από τα άλλα ως προς το μέγεθος (περίπου 100 τ.μ.), την εξαιρετική τοιχοδομία και την ύπαρξη ασβεστοκονιάματος στα δάπεδα και στους τοίχους. Από την απουσία ευρημάτων και το συμβολικό εύρημα μέσα σ' αυτό είναι βέβαιο ότι ο χώρος δεν χρησιμοποιήθηκε ως κατοικία αλλά επρόκειτο για ένα κοινοτικό κτήριο με κάποιες ιδιαίτερες χρήσεις.

Λίθινα σφαιρικά αντικείμενα συνήθως βρίσκονται μέσα σε ασβεστολιθικά πετρώματα σε περιοχές της Ιορδανίας αλλά μέχρι σήμερα δεν ήταν γνωστά στην περιοχή του Wadi Hasa. Απαντούν κυρίως στην ανατολική έρημο της χώρας (Black desert) μέσα σε αργιλικά στρώματα. Στην περιοχή γύρω από την ανασκαφή βρέθηκαν άλλες τρεις παρόμοιες σφαίρες διαφορετικού μεγέθους. Οι ασυνήθιστες αυτές σφαιρικές πέτρες που δεν φέρουν καμία επεξεργασία προφανώς προσείλκυσαν το ενδιαφέρον των κατοίκων του οικισμού. Η χρήση τους θα μπορούσε να συνδέεται με συμβολικές, μαγικές πρακτικές, ενώ επί πλέον η εγχάραξη δυο όμοιων συμβόλων πάνω σε ένα τέτοιο εξωπραγματικό και μαγικό αντικείμενο θα είχε κάποια ιδιαίτερη σημασία. Το κάθε σύμβολο αποτελείται από μία ευθεία γραμμή με δύο κεραίες που εκφύονται από αυτήν και θα μπορούσε να αποτελεί σχηματοποίηση ανθρώπινου σώματος με υψωμένα χέρια σε στάση δέησης, όπως οι μορφές πάνω σε πήλινα αγγεία ή σε άλλα υλικά που ασπαντούν στη Νεολιθική των Βαλκανίων. Ακριβώς όμοιο σύμβολο βρέθηκε μέσα στο

Locus 20 πάνω σε ελλειψοειδή ψαμμιτική πέτρα με διαστάσεις 0,18 x 0,16 και πάχος 0,03 μ. που φέρει οπή περίπου στο κέντρο.

Είναι εντυπωσιακή η πληθώρα των μυολίθων, τριπτήρων και λίθινων αγγείων (πάνω από 1500) που προήλθαν από όλους τους χώρους της ανασκαφής και από την επιφανειακή περισυλλογή. Τα αντικείμενα αυτά που είναι κατασκευασμένα από ψαμμίτη, το κύριο πέτρωμα της περιοχής, ασφαλώς δηλώνουν αφενός έντονη τροφοπαρασκευή και αφετέρου εντατικές καλλιέργειες σιτηρών. Επειδή η περιοχή βρίσκεται ανάμεσα σε βαθιά φαράγγια και απότομα βουνά όπου δεν υπάρχουν χώροι για καλλιέργεια, υποθέτουμε ότι οι χρήστες του χώρου καλλιεργούσαν εντατικά το πλάτωμα γύρω από τον οικισμό χρησιμοποιώντας πιθανώς και το νερό των δύο ποταμών.

Άλλα ευρήματα της ανασκαφής είναι χιλιάδες λίθινων τέχνηργων από πυριτόλιθο που ανήκουν σε πυρήνες, λεπίδες, αιχμές, οπείς, οδοντωτά εργαλεία και δρεπάνια, τα οποία μελετώνται επί τόπου από τον Δρ. Χρ. Ματζάνα. Αν και η μελέτη τους δεν έχει ολοκληρωθεί η αλυσίδα παραγωγής της θέσης (“chaîne opératoire”) είναι ήδη γνωστή. Υπάρχουν επίσης πολλά μικροαντικείμενα από πέτρα και όστρεο που αποτελούσαν κοσμήματα.

UNDERWATER ARCHAEOLOGY: HUNT FOR THE ANCIENT MARINER ARMED WITH HIGH-TECH METHODS, RESEARCHERS ARE SCOURING THE AEGEAN SEA FOR THE WORLD'S OLDEST SHIPWRECKS, BY JO MARCHANT

Brendan Foley peels his wetsuit to the waist and perches on the side of an inflatable boat as it skims across the sea just north of the island of Crete. At his feet are the dripping remains of a vase that moments earlier had been resting on the sea floor, its home for more than a millennium. “It’s our best day so far,” he says of his dive that morning. “We’ve discovered two ancient shipwrecks.”

Foley, a marine archaeologist at the Woods Hole Oceanographic Institution in Massachusetts, and his colleagues at Greece’s Ephorate of Underwater Antiquities in Athens have spent the day diving near the cliffs of the tiny island of Dia in the eastern Mediterranean. They have identified two clusters of pottery dating from the first century BC and fifth century AD. Together with other remains that the team has discovered on the island’s submerged slopes, the pots reveal that for centuries Greek, Roman and Byzantine traders used Dia as a refuge during storms, when they couldn’t safely reach Crete.

It is a nice archaeological discovery, but Foley was hoping for something much older. His four-week survey of the waters around Crete last October is part of a long-term effort to catalogue large numbers of ancient shipwrecks in the Aegean Sea. And the grand prize would be a wreck from one of the most influential and enigmatic cultures of the ancient world — the Minoans, who ruled these seas more than 3,000 years ago.

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Some researchers believe that quest to be close to impossible. But Foley and a few competitors are using high-tech approaches such as autonomous robots and new search strategies that they say have a good chance of locating the most ancient of shipwrecks. If they succeed, they could transform archaeologists’ understanding of a crucial period in human history, when ancient mariners first ventured long distances across the sea.

Archaeologists have precious little information about the seagoing habits of the Minoan civilization, which erected the palace of Knossos on Crete — linked to the Greek myth of

the Minotaur. Minoans far exceeded their neighbours in weaponry, literacy and art, and formed “part of the roots of what went on to become European civilization”, says Don Evely, an archaeologist at the British School at Athens, and curator of Knossos. Archaeologists are keen to understand what made the Minoans so successful and how they interacted with nearby cultures such as the Egyptians.

Although researchers have studied scores of Roman ships, finding a much older Minoan wreck “would add 100% new knowledge”, says Shelley Wachsmann, an expert in ancient seafaring at Texas A&M University in College Station.

Underwater treasure

A Bronze Age wreck called Ulu Burun shows how the remains of a single ship can transform archaeologists' understanding of an era. Discovered in 1982, it lies about 9 kilometres southeast of Kaş in southern Turkey, and dates from around 1300 BC, a century or two after the Minoans disappeared.

Christos Agourides, secretary-general of the Hellenic Institute of Marine Archaeology in Athens, describes it as “the dream of every marine archaeologist”. It took ten years to excavate, and researchers are still studying the nearly 17 tonnes of treasures recovered. The vast cargo includes ebony, ivory, ostrich eggs, resin, spices, weapons, jewellery and textiles as well as ingots of copper, tin and glass.

But what really stunned archaeologists was that the artefacts on this one vessel came from at least 11 different cultures¹ — from a gold scarab bearing the name of the Egyptian queen Nefertiti to copper from Cyprus and tin from central Asia.

The wreck provided tangible evidence of an astonishing array of contacts and trade between the different cultures of the Mediterranean and Near East in the late Bronze Age. The Ulu Burun ship sailed at around the time that Tutankhamun ruled Egypt, and “it is far more important than Tutankhamun's tomb as a contribution to our understanding of the period”, according to Wachsmann. “This goes to the nitty gritty of the world. It's Wall Street in a ship.”

The earlier Minoans set the stage for such a widespread trading network through their domination of the eastern Mediterranean. Their seafaring abilities were still celebrated 1,000 years later by Greek historian Thucydides, who credited the Minoans with building the world's first navy and ridding the seas of pirates. Although other contemporary Mediterranean cultures were starting to travel across the sea, the Minoans ventured farther than others, reaching distant ports in Syria, Cyprus, the Cyclades and Egypt (see map). Wachsmann describes them as the “Christopher Columbuses of the Bronze Age”.

Researchers have already found one potential Minoan wreck site by the island of Pseira, off the northeast coast of Crete. In 2003, archaeologist Elpida Hatzidaki of the Ephorate of Underwater Antiquities discovered a large collection of underwater pottery dating to around 1800 BC.

Expand

But at this site and a few even older ones, no portion of the ship itself survives, and it is hard to determine whether the pottery came from a wreck, was simply thrown overboard, or washed into the sea from the nearby coast. Even those who believe the Pseira site does represent a Minoan wreck admit that the pottery itself — everyday ware of local origin — doesn't reveal much new information. What archaeologists crave is an equivalent of Ulu Burun, a long-distance trading ship packed with valuable cargo that would reveal how different cultures interacted. “Ships were the way that people communicated and moved about the ancient world,” says Foley. “So if we can find these ancient wrecks, we get a much clearer view of the very dim past.”

That dream lured Foley and his team to Crete last year, and they brought a new tool that they hope will significantly raise the chances of finding an ancient shipwreck. In the past, archaeologists have explored the sea floor using divers and, more recently, remotely operated vehicles (ROVs) that are controlled by pilots on ship.

Foley's team tested an autonomous diving robot that could search the ocean bottom for hours under its own command. The REMUS 100 vehicle (for Remote Environmental Monitoring Underwater System) is equipped with Global Positioning System technology, side-scan sonar and a video camera. The Woods Hole researchers worked on the project with Greek archaeologists led by Theotokis Theodoulou of the Ephorate of Underwater Antiquities.

Robot rovers

The torpedo-shaped robot, nicknamed Gudgeon after a Second World War submarine, spent the first month of the field campaign surveying the entire sea floor north of Crete's main harbour, Heraklion, for any lumps and bumps that might signal an ancient wreck.

Foley had high hopes for the area because it had been a port for millennia and had never been surveyed by archaeologists. But the search came up empty handed. Close to shore, there was no hope of finding ancient wrecks because the sea floor was covered in a thick pile of sediments that had washed off the island. Farther out, the researchers found furrows left by trawl fishermen, who had scraped the sea floor clean, even in areas where trawling is supposedly forbidden.

So Foley's team moved its search to Dia, which lies just north of Heraklion. In 1976, the ocean explorer Jacques Cousteau found some ancient remains there, and Foley suspected that Dia might be a fertile site for shipwrecks because its steep cliffs could be lethal to vessels caught in a storm.

The team took a two-pronged approach to exploring around Dia. The Gudgeon crew prowled Dia's bays, where the ocean bottom is smooth and artefacts are more likely to show up in sonar images. Near shore, where the bottom is too rocky for Gudgeon, Foley and his team of divers made a circuit of the bays at about 40 metres depth.

Almost immediately, the divers located five ancient wrecks, ranging from around the second century BC to the ninth century AD. The discoveries confirmed Cousteau's impression that now-deserted Dia was used for centuries as an anchorage. And Foley was convinced that the Minoans must have been here too, with the evidence perhaps on the deeper floor of Dia's bays. But Gudgeon's sonar images from those sites kept coming back disappointingly clear.

On the penultimate day of the field season, Greg Packard and Mark Dennett of Woods Hole stood on the stern of their small research vessel, and swung Gudgeon overboard. The miniature explorer descended to the bottom and spent the morning cruising back and forth along preprogrammed gridlines. Later that evening, when Packard examined the sonar data, he spied a potential target — a patch of bright speckles amid the smooth dark image. The team debated whether it could be a heap of pottery on the sand.

The next day, Foley took his crew of divers out to the suspect site.

Some 15 minutes later, they came back with disheartening news: the sonar signal was a collection of plastic water bottles that must have been dumped overboard from a modern boat. And footage from Gudgeon's video camera explained the absence of archaeological remains — furrows in the sand showed that trawlers had cleaned out even these tiny bays.

If a Minoan ship ever sank here, it has long since been destroyed.

“It's such a waste,” says Foley, clearly disappointed. “I bet they're not even trawling for fish. I bet they're trawling for antiquities.”

Diving deeper

Wachsmann says that he isn't surprised by what Foley saw. From 2007 to 2009, he led the Danaos project, using sonar-equipped ROVs to survey hundreds of square kilometres of sea floor on a suspected ancient trading route between Crete and Egypt. In three seasons, he didn't find a single ancient wreck from any period, and only a scattering of artefacts.

Divers investigate a first-century-AD wreck near the Greek island of Dia.

B. FOLEY

Wachsmann found that sedimentation was a problem even far from shore — up to a metre per millennium in some areas. This means that although some Greek and Roman remains might still be visible, a Minoan ship would be buried under 3 or 4 metres of sand. And even at 500–600 metres depth, he saw clear evidence of trawling. “It was almost like somebody had swept the sea in front of me,” he says. On the basis of his experiences, Wachsmann now believes that the chance of finding a Minoan equivalent of Ulu Burun “approaches zero”.

The effect of bottom trawling is “devastating” for archaeologists, agrees Robert Ballard, an oceanographer based at the University of Rhode Island in Narragansett, who has pioneered deep-sea exploration and discovered the wreck of the Titanic in 1985. “Most of the Aegean has been destroyed,” he says.

Ballard has spent years searching for ancient wrecks and says that he has learned the importance of finding areas beyond the reach of fishermen — below about 600 metres, say, or close to undersea cables, which trawlers avoid. He has also opened up his search area.

Historians once assumed that the number of wrecks in the deep sea was negligible because ancient ships must have hugged the coastlines, but in the 1990s Ballard found eight ancient wrecks far from shore between the islands of Sicily and Sardinia² (Foley

was Ballard's graduate student at the time). “The ancient mariner was not afraid of going out to sea,” says Ballard.

Since 2008, Ballard has been exploring the eastern Mediterranean, the Aegean and the Black Sea with a suite of ROVs. Although he is finding large numbers of ancient wrecks, he hasn't yet uncovered anything from the Bronze Age. But, like Foley, he believes Minoan ships are waiting to be discovered. The key to finding the oldest wrecks, he says, is locating “relic surfaces” that have escaped being buried by sediment, which flows downhill and covers the deep sea floor³. “What you want is a shipwreck that came down on a mountain,” he says, because sediment can't accumulate on a steep slope.

Last year, Ballard investigated the Eratosthenes seamount, a 700-metre-deep tabletop south of Cyprus, and says it does indeed seem to represent a relic surface. He is now applying for permits to return to Eratosthenes to search for shipwrecks next year. Another area he would like to investigate is the submerged Anaximander mountains south of Turkey. It would be difficult to distinguish a wreck site from such rocky terrain using sonar, so he plans to use video cameras to conduct a painstaking visual search over smaller areas. “It's very hard hunting,” he says.

Foley is also now looking to the deep sea, but has a different strategy. Instead of targeting particular sweet spots, he wants to cover as large an area as possible. He has raised more than US\$1 million towards the \$1.8 million that he needs to return to the Mediterranean next year, this time with two of Gudgeon's more powerful cousins, REMUS 6000s owned by the Waitt Institute in La Jolla, California.

To maximize the chances of finding ancient wrecks, the team will hunt on open, flat areas in the lowest reaches of the sea, up to 6,000 metres deep. Foley estimates that the two REMUS vehicles can cover up to 5,000 square kilometres in one month, equivalent to 1% of the entire Aegean Sea. The recent field trial around Dia encouraged Foley because it should be easier for the sonar surveys to pick out vases than it was to find plastic water bottles, which are poor sonar reflectors, he says.

Both Ballard and Foley are ultimately hoping to use their surveys to catalogue large numbers of wrecks of all ages across great swathes of the Mediterranean and the Black Sea. Through a combination of sonar and high-resolution digital photography, they can compile detailed three-dimensional maps of a wreck site and answer questions about the date, origin and cargo of a ship without bringing up a single artefact.

Foley estimates that hundreds of thousands of ships must have sunk in ancient times — including thousands in the Bronze Age alone — and that a significant proportion of those are still sitting at the bottom of the deep sea. If he's right, then perhaps researchers will eventually have not just one Minoan ship, but hundreds. With enough wrecks, says Foley, “it ought to allow us to draw new conclusions about this absolutely formative period in human experience.”

That could shift marine archaeologists into an era in which they can use statistical data gathered from hundreds or thousands of wrecks to build up a bigger picture of trade routes, migration and warfare throughout history. “We'd rather find 500 ships than excavate one,” says Ballard.

Such a dream seems a long way off as Foley's team packs up its gear at the end of its campaign. Packard and Dennett carefully lower Gudgeon into a crate for its long trip back to Woods Hole, while Foley eyes one of the artefacts he retrieved from Dia's waters — a bulbous Byzantine amphora covered in deposits left by worms.

It's not the find Foley hoped for, but he is undaunted — this is just the beginning of what he knows could be a long search. “I'd like to be doing this every year for the next 20 or 30 years,” he says. “Until I'm too old to go to sea.”

Please visit the site: <http://www.nature.com/news/underwater-archaeology-hunt-for-the-ancient-mariner-1.9880> [Go there for pix]

ACROPOLIS OF FORGOTTEN KINGDOM **UNCOVERED THANKS TO ITALIAN** **EXCAVATIONS IN SOUTHERN** **CAPPADOCIA**

Numerous archaeological excavations are underway at a huge site in Anatolia which will uncover an ancient and rich yet forgotten kingdom known as Tuwana from the darkness of history, which will be featured in an open-air museum. The news was reported by Lorenzo d'Alfonso, an Italian archaeologist leading the joint mission by the University of Pavia and NYU, who provided details on the excavation campaign in a press conference in Istanbul this month, during which the details of the Italian archaeological missions in Turkey were explained. This "new discovery" from the pre-classical age which "needs to be continued" in southern Cappadocia took place in Kinik Hoyuk, the scholar said, referring to a site mainly involving the beginning of the first millennium BC.

The area is "fully" part of the "forgotten kingdom" of Tuwana, said d'Alfonso, known until now through hieroglyphics and from several sources from the Assyrian Empire, but "never studied archaeologically": "A completely intact site that has been left untouched", trying to "place it historically to understand which civilisation it belonged to and what its role was in the region".

Kinik Hoyuk, the archaeologist said, is "one of the major sites" in terms of size in pre-classical Anatolia, if you leave the capital of the Hittites out: the most conservative estimates say that it spans 24 hectares "but topographers say that it could cover 81 hectares". "A completely new mission" is working here, jointly began last year by the University of Pavia and NYU, which began collaborating with Turkish universities such as Erzurum and Nigde.

"The site was uncovered by excavations conducted by several colleagues, but its importance emerged in a campaign that we conducted," said d'Alfonso, who said that "southern Cappadocia is important because it controlled the Cilician Gates, or the passageway between the East and the West and between Europe and Asia": essentially, "one of the most important junctions" in the world during that period and at the "centre" of which lies Kinik Koyuk. Tuwana was a small buffer state between the Phrygian kingdom and the Assyrian Empire "and this is why it was particularly rich": "one of the great subjects of our study involves the cultural richness of this kingdom," said D'Alfonso, referring mainly to the development of the alphabet.

He pointed out that three steles from the Iron Age were uncovered in the area, "which are not very well preserved", but which do say a lot "about the importance that the site had".

The strategy of the excavation, said the archaeologist, was guided by "geomagnetic surveys in 2010 which revealed particularly significant remains of the acropolis wall and buildings at the centre of the acropolis itself": "monumental" walls excavated "to a height of 6 metres" in an outstanding state of preservation (or at least which "are not easily comparable to other pre-classical sites in Anatolia, particularly the central region"). "Original plaster was found" on the walls and we are planning on reinforcing it before restorations take place" starting next year. The excavation campaign was "planned from

the very beginning to be transformed into an open-air museum": Kinik Hoyuk, underlined D'Alfonso, is "easily accessible". Its "strength" is that it is only 45 minutes from the major tourist attractions in Cappadocia (and less than 2km from one of the major 4-lane roads in the region).

It is in the heart of a tourist route which is among the most important in Turkey, and therefore, the archaeologist said, the local government "fully supports the mission, seeing great possibilities for development in it".

Please visit the site:

http://www.ansamed.info/ansamed/en/news/nations/turkey/2012/02/10/visualizza_news.html_77413658.html

ARCHAEOLOGISTS STRIKE GOLD IN QUEST TO FIND QUEEN OF SHEBA'S WEALTH

A British excavation has struck archaeological gold with a discovery that may solve the mystery of where the Queen of Sheba derived her fabled treasures Dalya Alberge

A British excavation has struck archaeological gold with a discovery that may solve the mystery of where the Queen of Sheba of biblical legend derived her fabled treasures.

Almost 3,000 years ago, the ruler of Sheba, which spanned modern-day Ethiopia and Yemen, arrived in Jerusalem with vast quantities of gold to give to King Solomon. Now an enormous ancient goldmine, together with the ruins of a temple and the site of a battlefield, have been discovered in her former territory.

Louise Schofield, an archaeologist and former British Museum curator, who headed the excavation on the high Gheralta plateau in northern Ethiopia, said: "One of the things I've always loved about archaeology is the way it can tie up with legends and myths. The fact that we might have the Queen of Sheba's mines is extraordinary."

An initial clue lay in a 20ft stone stele (or slab) carved with a sun and crescent moon, the "calling card of the land of Sheba", Schofield said. "I crawled beneath the stone – wary of a 9ft cobra I was warned lives here – and came face to face with an inscription in Sabaean, the language that the Queen of Sheba would have spoken."

On a mound nearby she found parts of columns and finely carved stone channels from a buried temple that appears to be dedicated to the moon god, the main deity of Sheba, an 8th century BC civilisation that lasted 1,000 years. It revealed a victory in a battle nearby, where Schofield excavated ancient bones.

Although local people still pan for gold in the river, they were unaware of the ancient mine. Its shaft is buried some 4ft down, in a hill above which vultures swoop. An ancient human skull is embedded in the entrance shaft, which bears Sabaean chiselling.

Sheba was a powerful incense-trading kingdom that prospered through trade with Jerusalem and the Roman empire. The queen is immortalised in Qur'an and the Bible, which describes her visit to Solomon "with a very great retinue, with camels bearing spices, and very much gold and precious stones ... Then she gave the king 120 talents of gold, and a very great quantity of spices."

Although little is known about her, the queen's image inspired medieval Christian mystical works in which she embodied divine wisdom, as well as Turkish and Persian paintings, Handel's oratorio Solomon, and Hollywood films. Her story is still told across Africa and Arabia, and the Ethiopian tales are immortalised in the holy book the Kebra Nagast.

Hers is said to be one of the world's oldest love stories. The Bible says she visited Solomon to test his wisdom by asking him several riddles. Legend has it that he wooed her, and that descendants of their child, Menelik – son of the wise – became the kings of Abyssinia.

Schofield said that as she stood on the ancient site, in a rocky landscape of cacti and acacia trees, it was easy to imagine the queen arriving on a camel, overseeing slaves and elephants dragging rocks from the mine.

Schofield will begin a full excavation once she has the funds and hopes to establish the precise size of the mine, whose entrance is blocked by boulders.

Tests by a gold prospector who alerted her to the mine show that it is extensive, with a proper shaft and tunnel big enough to walk along.

Schofield was instrumental in setting up the multinational rescue excavations at the Roman city of Zeugma on the Euphrates before it was flooded for the Birecik dam. Her latest discovery was made during her environmental development work in Ethiopia, an irrigation, farming and eco-tourism project on behalf of the Tigray Trust, a charity she founded to develop a sustainable lifestyle for 10,000 inhabitants around Maikado, where people eke out a living from subsistence farming.

Sean Kingsley, archaeologist and author of *God's Gold*, said: "Where Sheba dug her golden riches is one of the great stories of the Old Testament. Timna in the Negev desert is falsely known as 'King Solomon's Mines', but anything shinier has eluded us.

"The idea that the ruins of Sheba's empire will once more bring life to the villages around Maikado is truly poetic and appropriate. Making the past relevant to the present is exactly what archaeologists should be doing."

Please visit the site: <http://www.guardian.co.uk/science/2012/feb/12/archaeologists-and-quest-for-sheba-goldmines> [Go there for pix]

INSIDE THE ARCHAEOLOGY OF PALEOFECES

Ancient Poop Science: Inside the Archaeology of Paleofeces
The invention of the toilet accomplished many good things, but it did rob us of the chance at immortality - through our poop. Ancient humans have revealed some of their greatest secrets through paleofeces, the study of the waste they left behind.

In studying ancient humanity, there's no more powerful resource than preserved DNA theoretically. While DNA has evolved to be the molecule of life, it's not built nearly as well to stick around after its organism is dead and gone. There are a few ways to preserve DNA for up to as much as a million years without complete degradation, but these mostly involve being frozen in ice or permafrost. Since most of humanity historically has stayed away from extremely cold climates, that naturally limits our sources of usable ancient human DNA.

That's where poop enters the picture. As one of the great works of Western literature once so cogently observed, everybody does it — and in the 99% or so of human history without sanitation services, humans pretty much just pooped wherever there was space. These "nonhardened fossils", as archaeologists have euphemistically referred to them, account for a shockingly high percentage of the material found in ancient cave sites. There's such a ridiculously high quantity of preserved human poop — paleofeces, if we're being technical — that being able to extract any amount of DNA would make them a massively useful resource.

Luckily, the dry, cool conditions of these caves provide workable conditions to preserve DNA for posterity, and the paleofeces provide the carrier that protects the DNA on its journey into history. The ancient dung can hold onto recoverable DNA through a process known as the Maillard reaction. As the feces dried out all those thousands of years ago, the sugars from the digested plant material began to react with surrounding amino acids, forming larger sugar compounds that formed around and encased the DNA, preserving it for future extraction. This same chemical reaction is crucial today in the coloring and flavoring of a bunch of foods, including French fries, biscuits, maple syrup, and brioche.

A 2005 article in *Current Science* recounts the simple, five-step process to extract DNA from poop. All you need is some liquid nitrogen, a diabetes drug, and a polymerase chain reaction machine... oh, and some preserved dung, of course. Freezing the samples in the liquid nitrogen allows them to be ground down to a fine powder, although the individual grains are still significantly bigger than the individual sugar and DNA fragments.

Next, the diabetes drug, which is designed to help people control their high blood sugar, is used to break down the sugar compounds surrounding the DNA. The chain reaction machine is used to make millions of copies of the recovered DNA, which can then be sequenced and compared to other DNA fragments from different sources, such as bones found at the same site. This is useful in establishing the accuracy of the sequencing and ensuring that degradation hasn't robbed the DNA of the useful information it once contained.

Ancient Poop Science: Inside the Archaeology of Paleofeces The first successful recovery of DNA from poop came in 1998, when Hendrik Poinar and Svante Paabo, at the time scientists at the Max Planck Institute in Munich, released DNA left by now-extinct ground sloths some 20,000 years ago. Poinar, who has since become one of, if not the leading expert in the archaeology of poop — though I'm guessing he wouldn't phrase it quite like that — then had similar success with dung samples from an extinct goat species and another ground sloth species. But these were all just examples of animal crap, which are called coprolites to distinguish them from the human paleofeces.

The big breakthrough in human DNA extraction came with the arrival of Kristin Sobolik, and archaeologist at the University of Maine Orono, who proposed Poinar and his colleagues test some of the thousands of paleofeces specimens found in Hinds Cave (pictured up top), an ancient dwelling in southern Texas whose preserved poop samples date from 8,500 to just 500 years ago. Using the method outlined above, the researchers tested five small samples dating between 400 and 100 BCE.

Their remarkable results are recounted in a July 2000 article in *Science*:

Poinar pulled out human mitochondrial DNA and found sequences, called haplogroups, that are known to be Native American. (An independent lab has replicated the findings.) The group next extracted chloroplast DNA, from which they matched sequences to buckthorn, acorns, sunflower, a shrub called ocotillo, and a kind of nightshade, probably wild tobacco. Sobolik examined the samples under a microscope but could see no remnants of these plants. (On the other hand, cacti and rodents found by Sobolik did not show up in the molecular analysis.) Both the DNA and visual methods identified traces of legumes, yuccas, and elm, which may have been used to brew tea.

The paleofeces also contain visible bones of pack rats and mice, as well as fish scales. Poinar didn't find DNA from these, perhaps because the samples that he tested lacked the tiny bone fragments.

However, he did find sequences for sheep and pronghorn antelope, bones of which have not been found in Hinds Cave. That suggests that the large game was killed and eaten elsewhere, Poinar says.

That's just an absurd amount of information, and it's almost all from the poop. Indeed, this is part of why paleofeces are such a powerful archaeological tool - they don't just reveal the DNA of a single organism, as bones would, but instead they give you the DNA of the organism and all the things it ate. In this case, it helped reveal the incredible diversity of foods eaten by these ancient hunter-gatherers, which is a vital fact of their existence that would have otherwise remain hidden from the view of archaeologists.

Indeed, the prevailing view before Poinar and Sobolik's work was that these ancient humans subsisted on a poor diet heavily dependent on foraged berries. On the contrary, one of the samples contained evidence of four different animals and three different plants, all of which had been eaten in the two days or so before defecation — I suspect a worrying percentage of modern poop couldn't match that kind of nutritional diversity. And thus, an ancient truth was illuminated...by poop.

There's really only one final, vital question left to consider, at least as far as I'm concerned — does ancient poop smell? Kristin Sobolik addressed this all-important

question in a 2008 interview with the magazine Odyssey. The dried poop itself has no particular smell.

The organic compounds that give poop its odor are encased inside the sugar compounds alongside the DNA — which means that the process of extracting the DNA can also mean releasing the poop smell of somebody who lived thousands of years ago. Now if that isn't leaving a legacy to future generations, I really don't know what is.

Hinds Cave and Coprolite images by TAMU Anthropology Archives and Glenna Williams-Dean.

Sources

"Extraction of DNA from Paleofeces" by Melanie Kuch and Hendrik Poinar "Divining Diet and Disease From DNA" by Erik Stokstad, Science "Poop Sleuth" by Mark Witten, Current Science "Mysteries of ancient people poop: Vaughn Bryant and Kristin D. Sobolik" by Geoff Williams, Odyssey

Please visit the site: <http://io9.com/5883873/paleofeces-inside-the-archaeology-of-poop>

FOUR UNKNOWN SHIPWRECKS FOUND **30 KILOMETERS OFF THE BAY OF** **IRAKLEIO, CRETE**

Four previously unknown shipwrecks have been discovered some 30 kilometers off the Bay of Irakleio, Crete, in recent underwater exploration conducted by the ephorate of underwater antiquities.

The new finds comprise two Roman era shipwrecks, one containing 1st and 2nd-century Cretan amphorae and the other containing 5th-7th century post-Roman era amphorae, and two shipwrecks containing Byzantine amphorae, dated from the 8th-9th century and later.

The finds, which were made south and east of the Dia islet, which lies 7 nautical miles north of Irakleio, were documented and taken ashore for further analysis.

Three more recent shipwrecks were also discovered, as well as four other areas with archaeological material of various eras and origin which, due to their immense research interest, will be further explored in 2012 by the ephorate.

The exploration was conducted to locate and record underwater antiquities in the wider area of the bay of Irakleio, as well as the Gulf of Yera of Lesvos island and the island of Tilos. (AMNA, Athens News)

Please visit the site: <http://www.athensnews.gr/portal/41/53466>

ARCHAEOLOGISTS ARE BRINGING JERUSALEM'S ANCIENT ROMAN CITY BACK TO LIFE EXCAVATIONS OF THE ROMAN CITY AELIA CAPITOLINA, BUILT ON THE RUINS OF SECOND TEMPLE-PERIOD JERUSALEM, HAVE UNEARTHED A FEW SURPRISES, BY NIR HASSON

If you look at a map of the Old City of Jerusalem, you'll notice something odd. While the vast majority of the Old City's streets form a crowded casbah of winding alleyways, there are a few straight-as-a-ruler streets that bisect the city from north to south and east to west.

The best known of these straight roads are Beit Chabad and Hagai streets, exiting through the Damascus Gate; David Street, exiting the Jaffa Gate; and the Via Dolorosa.

Like the rest of the Old City's streets, these straight roads are narrow but, unlike the others, they preserve a historical skeleton of sorts that forms the basis of the Old City we know today. This skeleton was created, most archaeologists agree, not during Jewish, Christian or Muslim rule, but during the Roman period, when the city of Aelia Capitolina was built on the ruins of Jerusalem following the destruction of the Second Temple in 70 AD.

Ironically, it is actually the streets of this imperial and pagan city - which supposedly left behind no cultural or spiritual heritage for modern Jerusalem - that have bequeathed to the city the skeleton structure that has survived to this day.

In the history of Jewish Jerusalem, Aelia Capitolina is the very embodiment of defeat and destruction - a reminder of the humiliation of the Second Temple's destruction, which erected a pagan temple in its place. This image has distanced Aelia Capitolina from the fathers of Israeli archaeology, who were naturally drawn to the ornate, Jewish city that preceded it. "No one concealed Aelia Capitolina, but we wanted to talk about the Second Temple," says Dr. Ofer Sion, of the Antiquities Authority. "Aelia Capitolina was an accursed city, a city from which we were banished. It was more idealistic to excavate the Second Temple."

Almost all of the archaeologists who study Aelia Capitolina call it "an elusive city." As opposed to the Jerusalem of Second Temple times that preceded it, Aelia Capitolina has not been entirely unearthed during the many excavations that have been performed in the city since 1967. The residents of Aelia Capitolina did not leave written texts like the works of Flavius Josephus during the Second Temple era or of Christian travelers in the following period.

It is known that the Roman city was established by Emperor Hadrian between 130 and 140 AD. After the Bar Kochba revolt of 135, Jews were forbidden to enter the city. Its most important inhabitants were the soldiers of the 10th Legion, who would remain encamped in Jerusalem for 200 years.

Salvage operations

Following the latest wave of excavations, which began in the mid-1990s, more and more archaeologists have become convinced that Aelia Capitolina was a much larger and more important city than was once thought, and its influence on the later development of modern Jerusalem was dramatic.

Aelia Capitolina has sprung to life in a significant way through no less than four extensive excavations that have taken place in the Old City area, and in a number of other digs in other parts of Jerusalem.

Most of these digs have been rescue excavations by the Antiquities Authority, salvage digs carried out before new construction and development goes ahead. In a few more years, Aelia Capitolina could again be covered over by new buildings.

In the rear section of the Western Wall plaza, in the spot where the Western Wall Heritage Foundation intends to erect a large building that it calls "the Core House," Antiquities Authority researcher Shlomit Wexler-Bedolah discovered an ornate and broad Roman street, complete with shops on each side. This is the eastern cardo, along whose path Hagai Street would later be paved.

Three hundred meters to the south, another Antiquities Authority researcher, Dr. Doron Ben-Ami, discovered the place where the Roman street apparently ended. The corner of the street is adjacent to the Givati parking lot at the top of the Silwan valley - the spot where the Elad organization intends to build a large visitors center. In a large rescue excavation at this location in recent years, Ben-Ami exposed a large, fancy Roman villa unlike any other structure from its time in the entire country. He estimates that the villa he uncovered was the home of the regional governor or some other central authority.

In another excavation, in the tunnel under the Western Wall, Wexler-Bedolah and archaeologist Alexander Onn re-estimated the dating of a large bridge leading to the Temple Mount. As with other ancient monuments this too turned out to be of Roman origin and not from the Second Temple period. Another example is the Roman bathhouse and swimming pool discovered by Sion a year and a half ago. "It's a tremendous spa, a country club," Sion says, comparing the bathhouse to similar facilities found in other parts of the Roman Empire.

This increasing number of Roman-era discoveries strengthens the notion that the Temple Mount, even after its destruction, did not lie totally barren, but was used for pagan worship rites.

But not only the Old City and its immediate surroundings have turned up new findings from Aelia Capitolina. Excavations made a few years ago in the area near the Binyanei Ha'uma international convention center, carried out in preparation for the expansion of the Crowne Plaza Hotel, uncovered a large pottery-workers village that served as the

legion's central clayware manufacturing plant. Along the route of Jerusalem's new light-rail, remains of a large water facility serving the legionnaires were discovered, and in the area of Shuafat, a Jewish settlement from the same period was discovered.

The latest excavations give archaeologists much greater insight into Aelia Capitolina than was possible even a decade earlier. Experts agree the city was planned extraordinarily well, based as it was on designs of other cities in the empire and according to orders that came directly from the emperor. It included broad streets, numerous and magnificent entrance gates, temples and infrastructure, and it even housed a new elite of army officers and free soldiers who turned Aelia Capitolina into a thriving city.

"When I began to study the history of the Roman city, it was a barren field," says Prof. Yoram Zafrir, one of Israel's most veteran archaeologists. "Today, it is clear that the basic structure of Jerusalem is that of Aelia Capitolina." Zafrir describes the process by which, after the Roman period, beasts of burden replaced wagons, the central government became weak and streets became "privatized."

This process led to the city that we know today.

"Similarly to the British Mandate, which lasted just 31 years but had a significant impact on modern Jerusalem, from the perspective of architecture, the Roman period established a whole new, imperial language that still holds sway today," archaeologist Dr. Guy Stiebel concludes. Stiebel even notes the irony of history: "Aelia Capitolina effectively saved Jerusalem. It raised her once again onto the stage of history. She returned like a phoenix from the ashes."

Please visit the site: <http://www.haaretz.com/print-edition/news/1.413874>

ANCIENT PLANTS BACK TO LIFE **AFTER 30,000 FROZEN YEARS RICHARD** **BLACK, BY RICHARD BLACK**

Scientists in Russia have grown plants from fruit stored away in permafrost by squirrels over 30,000 years ago. The fruit was found in the banks of the Kolmya River in Siberia, a top site for people looking for mammoth bones.

The Institute of Cell Biophysics team raised plants of *Silene stenophylla* - of the campion family - from the fruit. Writing in Proceedings of the National Academy of Sciences (PNAS), they note this is the oldest plant material by far to have been brought to life.

Prior to this, the record lay with date palm seeds stored for 2,000 years at Masada in Israel.

The leader of the research team, Professor David Gilichinsky, died a few days before his paper was published.

In it, he and his colleagues describe finding about 70 squirrel hibernation burrows in the river bank.

"All burrows were found at depths of 20-40m from the present day surface and located in layers containing bones of large mammals such as mammoth, woolly rhinoceros, bison, horse, deer, and other representatives of fauna from the age of mammoths, as well as plant remains," they write.

"The presence of vertical ice wedges demonstrates that it has been continuously frozen and never thawed.

"Accordingly, the fossil burrows and their content have never been defrosted since burial and simultaneous freezing."

The squirrels appear to have stashed their store in the coldest part of their burrow, which subsequently froze permanently, presumably due to a cooling of the local climate.

Sugar sweet

Back in the lab, near Moscow, the team's attempts to germinate mature seeds failed.

Silene stenophylla The fruits grew into healthy plants, though subtly different from modern examples of the species

Eventually they found success using elements of the fruit itself, which they refer to as "placental tissue" and propagated in laboratory dishes.

"This is by far the most extraordinary example of extreme longevity for material from higher plants," commented Robin Probert, head of conservation and technology at the UK's Millennium Seed Bank.

"I'm not surprised that it's been possible to find living material as old as this, and this is exactly where we would go looking, in permafrost and these fossilised rodent burrows with their caches of seeds.

"But it is a surprise to me that they're finding viable material from this placental tissue rather than mature seeds."

The Russian team's theory is that the tissue cells are full of sucrose that would have formed food for the growing plants.

Sugars are preservatives; they are even being researched as a way of keeping vaccines fresh in the hot climates of Africa without the need for refrigeration.

So it may be that the sugar-rich cells were able to survive in a potentially viable state for so long.

Silene stenophylla still grows on the Siberian tundra; and when the researchers compared modern-day plants against their resurrected cousins, they found subtle differences in the shape of petals and the sex of flowers, for reasons that are not evident.

The scientists suggest in their PNAS paper that research of this kind can help in studies of evolution, and shed light on environmental conditions in past millennia.

But perhaps the most enticing suggestion is that it might be possible, using the same techniques, to raise plants that are now extinct - provided that Arctic ground squirrels or some other creatures secreted away the fruit and seeds.

"We'd predict that seeds would stay viable for thousands, possibly tens of thousands of years - I don't think anyone would expect hundreds of thousands of years," said Dr Probert.

"[So] there is an opportunity to resurrect flowering plants that have gone extinct in the same way that we talk about bringing mammoths back to life, the Jurassic Park kind of idea."

Please visit the site: <http://www.bbc.co.uk/news/science-environment-17100574>

ARCHAEOLOGISTS EXCAVATE **MAGNIFICENT MONUMENTAL CITY OF** **THE DECAPOLIS SUN**

Archaeologists and students are excavating a rich motherlode of well-preserved remains at the site of the monumental city of Hippos, devastated by a massive eighth century C.E. earthquake that made it all possible.

A line of fallen ancient columns remain in place today, undisturbed, configured exactly where they fell after a massive, devastating earthquake destroyed this city on January 18th, 749 C.E. They appear as though the event had happened only yesterday. Images of ancient Pompeii come to mind.

But this was not Pompeii.

Known as Antiochia Hippos (Hippos meaning "horse", or Hebrew Sussita, also meaning "horse"), its ruins are perched atop Sussita Mountain, an isolated table-top mountain that overlooks the eastern bank of Lake Kinneret (the Sea of Galilee) in present-day Israel. Established initially by the Seleucids as a Greco-Roman enclave, it once controlled two port facilities on the lake and its surrounding countryside. Hippos was part of the "Decapolis", a group of ten cities in Roman Palestine that were maintained as Greco-Roman cultural islands in the Near East. The damage the earthquake caused Hippos was so severe that its citizens abandoned it, never to return again. This left it to the ages with no succeeding settlement and, coupled with its relative isolation and enduring basaltic construction, preserved it much like it was left in the 8th century for 20th century archaeologists to explore. Since the year 2000, a team of archaeologists, specialists, students and volunteers under Professor Arthur Segal and Dr. Michael Eisenberg of the Zinman Institute of Archaeology, University of Haifa, have been excavating the site.

"Twelve years of continuous archaeological excavations on the site," report Segal and Eisenberg, "have unearthed a wealth of Hellenistic, Roman, Byzantine and Umayyad structures erected during a period of a thousand years – from the 2nd century BCE to the 8th century CE. Yet much excavation work still has to be done to reveal the city in all its former magnificence and glory."

Thus far, Segal and Eisenberg and their team have excavated a 42 x 42m Roman forum complex, a 55 x 30m Roman basilica, a structure called a "kalybe" (an imperial cult shrine established to express loyalty to Roman imperial rule), the walls of a Hellenistic sanctuary, or temenos, an odeion (a small theatre-like structure used for small-scale entertainment events), and the remains of two Byzantine churches.

Says Eisenberg: "During the past twelve seasons we have exposed only a small percentage of the total area of Hippos. Excavation is still in its first stages, but what has so far been discovered is sufficient to show that this is a fascinating site.....The building complexes, the rough wildness of the area, as well as the sweeping panorama of the landscape viewed from the mountain top overlooking the Kinneret and the Galilee, make Hippos one of the most attractive and impressive archaeological sites in Israel."

Segal and Eisenberg hope to be able to uncover the entire ancient city, including its street network, its main religious and public buildings, as well as its domestic sectors, with an eye toward ultimately shedding more light on our understanding of the presence and role of Hellenistic and Roman culture in the Near East between the 2nd century BCE and the 8th century CE. They intend to do this one year, one season at a time, setting smaller, more manageable objectives through time. "During the four weeks of July 2012, the 13th season of excavations will be held at the site", says Segal. "This time we will focus on the Roman basilica, on the residential quarter to the west, on the Roman bathhouse to the south, and on exposing the northeast insula".

Individuals interested in participating in the Hippos excavations may obtain detailed information by going to the website:

<http://hippos.haifa.ac.il/>, or by inquiry to Dr. Michael Eisenberg:
hippos@research.haifa.ac.il.

Please visit the site: <http://popular-archaeology.com/issue/december-2011/article/archaeologists-excavate-magnificent-monumental-city-of-the-decapolis>

EGYPT BEGINS THE RESTORATION OF A 4,500-YEAR OLD BOAT FOUND NEAR PYRAMIDS

Archaeologists on Monday began restoration on a 4,500-year-old wooden boat found next to the pyramids, one of Egypt's main tourist attractions.

The boat is one of two that were buried next to the Pharaoh Khufu, spokesmen for a joint Egyptian-Japanese team of archeologists said.

The boats are believed to have been intended to carry pharaohs into the afterlife.

Khufu, also known as Cheops, is credited with building the Great Pyramid of Giza, the largest of the pyramids. Khufu, son of Snefru, was the second ruler of the 4th Dynasty around 2680 B.C. and ruled Egypt for 23 years.

Both boats, made from Lebanese cedar and Egyptian acacia trees, were originally discovered in 1954. One of the boats is on display at a museum near the pyramids.

The second boat, which is now undergoing the restoration, remained buried. It is thought to be smaller than its sister ship, which is about 140 feet (43 meters) long.

The head of Egypt's Supreme Council of Antiquities, Mustafa Amin, said Egyptologists began taking samples of the wood for restoration on Monday.

"The boat was found in a complete shape, intact and in place," he said, adding that the focus now is on taking samples of the wood.

He said Egyptologists are studying "the different components and fungus in the wood in order to find the most sufficient and advanced way to work on the wood."

Last year in June, a team of scientists lifted the first of 41 limestone slabs each weighing about 16 tons to uncover the pit in which the ancient ship was buried, said Sakuji Yoshimura, professor from Japan's Waseda University.

At the time, experts said restoration would likely take about four years and that at its completion, the boat would be placed on display at the Solar Boat Museum near the pyramids, which routinely attract millions of tourists and boost one of Egypt's most important industries.

The team had initially thought the vessel would be safer left underground than exposed to pollution, but evidence showed that pollution, water and insects had invaded the boat's chamber.

A \$10 million grant from Waseda University has helped in preparing the ship's excavation process.

Please visit the site: http://www.washingtonpost.com/world/middle-east/egypt-begins-the-restoration-of-a-4500-year-old-boat-found-near-pyramids/2012/02/20/gIQADhmUPR_story.html

EVIDENCE OF MASSACRE IN BRONZE AGE TURKEY, BY KATY MEYERS

Determining social relationships between populations in the past can be difficult. Trade can be inferred from evidence such as pottery with foreign designs, or non-local foods. Warfare can be determined from the presence of mass graves or cemeteries of adult males displaying trauma, or weaponry showing signs of frequent use. However, trauma is not always a sign of conflict with external populations. It can also reflect the normal struggles of daily life or even interpersonal violence within the community.

Skeletal collections with trauma found from the Neolithic period in Anatolia suggest that injury was caused by daily activities and lifestyle, rather than systematic violence. However, shortly after this period there is an increase in trauma associated with violence that may suggest an increase in stress within and between populations in this area. In order to examine this conclusion, a new article by Erdal (2012) looked at the skeletal remains of a potential massacre site from the Early Bronze Age in Turkey. Mass burial in plastered basin in the Outer Town at Titris Hoyuk.

The human remains come from the site of Titriş Höyük, dating to 2900-2100 BCE. The site grew very quickly in this period from a small farming community to an urban centre within a large mud-brick fortification wall built over a stone foundation. Within one of the house structures (House #2, Room 13), a burial was found in a plaster basin beneath the floors. While the location of the burial and the basin are not unique, the state of the individuals is.

Unique burial

Instead of the normal burials recovered from these basins, the team from University of California, San Diego and University of Akron found a large number of disarticulated remains with the crania placed at the top. Based on the strata of the burial, it is unknown whether this burial was created in a single moment or over time. Given their layout and the slight connection of some of the remains, it was more likely there was a single burial episode rather than a multiple event internment. Since the bones were co-mingled, determining the number of individuals required counting the number of repeating bone elements.

The researchers looked at crania and long bones and from this they argue there are a minimum number of 13 adult males, 3 adult females and 3 sub-adults. This burial dates to the end of the period of occupation, approximately 2200-2100 BCE.

Analysing the wounds

The trauma analysis was done using the cranial remains and classified as premortem (before death), perimortem (sustained at death) or postmortem (after death). This was determined by looking at wounds for evidence of healing that would indicate it was sustained prior to death, or bright white colouration which means it was sustained after death (potentially caused by damage done during the excavation or collapse of the grave over time). Location of the trauma and appearance was recorded, as well as shape of the wound in order to determine potential weapons. When looking at the appearance and

shape, Erdal (2012) recorded whether there was the appearance of radiating concentric lines indicative of blunt force trauma, or V shaped inward fractures indicative of sharp force trauma.

The results of the study showed that 11 of the 13 males had sign of one or more cranial traumas, only 1 female had signs of trauma, and there was no sign of trauma in the sub-adults. Of them, 13 of the 14 cranial traumas were unhealed and suggestive of perimortem damage.

Most individuals suffered multiple wounds, resulting in a total of 26 unhealed cranial traumas for the entire sample. The most frequent appearance was inward bevelling with concentric fractures radiating from the centre, 23 of these were penetrating completely through the bone, and they were primarily found on the parietal bones. Comparing size of the wounds, Erdal (2012) found that they occurred in two specific clusters, which potentially means there were two types of weapon used.

Identifying violence in the past from skeletal remains can be difficult, and many archaeologists argue that the presence of embedded weapons is the only true indicator. However, trauma found on skulls caused by blunt or sharp weapons are a fairly good indicator of conflict, warfare or massacre according to Erdal (2012).

The presence of such a high number of perimortem wounds, all in the same area and occurring on the majority of individuals in a single mass grave all point to the conclusion that their deaths, or at least injuries, were not accidental. Combining this with the evidence of fortifications around the city suggests that these individuals were killed by intruders rather than interpersonal violence. Comparing the two types of injury clusters with weapons from this period leads to the conclusion that they were caused by battle axes in the case of the larger injuries, and dagger or spears for the smaller ones.

Evidence of violence and cultural change Erdal (2012) argues that “the frequency of perimortem trauma increases during periods of environmental deterioration, population growth, political breakdown and competition over resources while sub-lethal cranial trauma are observable during all periods”. Since Anatolia was undergoing a period of environmental, as well as cultural change, it is likely that violence was one of the consequences.

Combining this data with other sites from this period in Turkey may reveal an overall trend of increased violence in the Neolithic / Bronze Age transition. The conclusion is based on a fairly extensive dataset, and is well argued in Erdal’s paper. There is further discussion of the meaning behind the plaster basins the individuals were found in. This is a good example of combining bioarchaeology with the contextual archaeological evidence, both in the grave and mortuary setting, but also the broader cultural and environmental context. It is concluded that the collapse of the Akkadian Empire, the deterioration of the trade-based economy and resource stress might have been possible factors that played a role in the excessive violence, or even a massacre in Titriş Höyük.

Katy Meyers is a graduate student in the department of anthropology at Michigan State University.

Please visit the site:

<http://www.pasthorizonspr.com/index.php/archives/02/2012/evidence-of-massacre-in-bronze-age-turkey>

ARCHAEOLOGISTS DISCOVER **JORDAN’S EARLIEST BUILDINGS, BY** **LISA MAHER**

Some of the earliest evidence of prehistoric architecture has been discovered in the Jordanian desert, providing archaeologists with a new perspective on how humans lived 20,000 years ago.

Archaeologists working in eastern Jordan have announced the discovery of 20,000-year-old hut structures, the earliest yet found in the Kingdom. The finding suggests that the area was once intensively occupied and that the origins of architecture in the region date back twenty millennia, before the emergence of agriculture.

The research, published 15 February, 2012 in PLoS One by a joint British, Danish, American and Jordanian team, describes huts that hunter-gatherers used as long-term residences and suggests that many behaviours that have been associated with later cultures and communities, such as a growing attachment to a location and a far-reaching social network, existed up to 10,000 years earlier.

Excavations at the site of Kharaneh IV are providing archaeologists with a new perspective on how humans lived 20,000 years ago. Although the area is starkly dry and barren today, during the last Ice Age the deserts of Jordan were in bloom, with rivers, streams, and seasonal lakes and ponds providing a rich environment for hunter-gatherers to settle in.

“What we witness at the site of Kharaneh IV in the Jordanian desert is an enormous concentration of people in one place,” explained Dr Jay Stock from the Department of Archaeology and Anthropology at the University of Cambridge and co-author of the article.

“People lived here for considerable periods of time when these huts were built. They exchanged objects with other groups in the region and even buried their dead at the site. These activities precede the settlements associated with the emergence of agriculture, which replaced hunting and gathering later on. At Kharaneh IV we have been able to document similar behaviour a full 10,000 years before agriculture appears on the scene.”

The archaeologists, who were funded by a grant from the Arts and Humanities Research Council UK, spent three seasons excavating at the large open-air site covering two hectares. They recovered hundreds of thousands of stone tools, animal bones and other finds from Kharaneh IV, which today appears as little more than a mound 3 m high rising above the desert landscape.

Based on the size and density of the site, the researchers had long suspected that Kharaneh IV was frequented by large numbers of people for long periods of time; these latest findings now confirm their theory. “It may not look very impressive to the untrained eye, but it is one of the densest and largest Palaeolithic open-air sites in the

region,” said Dr Lisa Maher, from the University of California, Berkeley, who spearheads the excavations.

“The stone tools and animal bone vastly exceed the amounts recovered from most other sites of this time period in southwest Asia.” In addition, the team also recovered rarer items, such as shell beads, bones with regularly incised lines and a fragment of limestone with geometric carved patterns.

So far, the team has fully excavated two huts; but there may be several more hidden beneath the desert’s sands. “They’re not large by any means. They measure about 2–3 m in maximum length and were dug into the ground. The walls and roof were made of brush wood, which then burnt and collapsed leaving dark coloured marks,” described Dr Tobias Richter from the University of Copenhagen and one of the project’s co-directors.

Radiocarbon dating suggests that the hut is between 19,300 and 18,600 years old. Although a team of archaeologists working at Ohalo II on the shore of the Sea of Galilee in 1989 found the region’s oldest hut structures, which date from 23,000 years ago, the team working at the Kharaneh IV site believe their discovery is no less significant, as Dr Maher explained:

“Inside the huts, we found intentionally burnt piles of gazelle horn cores, clumps of red ochre pigment and a cache of hundreds of pierced marine shells. These shell beads were brought to the site from the Mediterranean and Red Sea over 250 km away, showing that people were very well linked to regional social networks and exchanged items across considerable distances.”

Please visit the site: <http://www.cam.ac.uk/research/news/archaeologists-discover-jordans-earliest-buildings/>

SCIENTISTS FIND 4500-YEAR OLD TEMPLE IN UR IN IRAQ, BY SHAYMAA ADEL

Iraqi and foreign archaeologists have uncovered a temple at the Sumerian city of Ur, which dates back to about 2500 B.C., the head of the Antiquities Department says.

So far the scientists have uncovered one of the walls of the temple along with numerous graves from the same period, said Hussein Rashid.

Ur is one of ancient Iraq's most fascinating cities. It has given the world priceless treasures from the Sumerian civilization that flourished in southern Iraq.

The Sumerians, whose ethnic and linguistic stock is still a mystery, invented writing and established a civil system of government in southern Iraq more than 5000 years ago.

“An Italian excavation team in coordination with their Iraqi counterparts have uncovered the wall of a temple dating to 2500 B.C. at Tel Abu Tabeer in the ancient city of Ur,” said Rashid.

Rashid said there were three foreign excavation teams currently working in Iraq. It is the first team of foreign archaeologists to be working in the country for more than two decades.

Rashid said an American team was to arrive in Iraq to excavate ancient mounds in the southern city of Nasiriya, the capital of Dhi Qar Province where the richest and most ancient Mesopotamian ruins are found.

Rashid also said another Italian group will be arriving in the country to excavate the ancient Assyrian military capital, Nimrud, in the northern Province of Nineveh.

The Italian team in Ur is closely cooperating with scientist at Dhi Qar University. Rashid said Italian scientists will be lecturing on Iraq's ancient civilizations and languages in English.

Ur is the dream place for foreign scientists specialized in Near Eastern studies. It is often referred to in the literature as “the world's Archaeological Museum” for its great number of ancient sites.

Please visit the site:

<http://www.azzaman.com/english/index.asp?fname=news%5C2012-02-23%5Ckurd.htm>

ANCIENT CAVE SPEAKS OF HADES MYTH

There, in a gloomy underworld, departed heroes such as Achilles gathered mostly to grouse about their boredom, and await the verdict of the judges of the dead.

"I would rather be a paid servant in a poor man's house and be above ground than king of kings among the dead," said Achilles, the greatest of Greek heroes, commenting on the scenery, according to the ancient poem, *The Odyssey*. (Tough break for Achilles, but perhaps he was later cheered to learn that Brad Pitt would play him in the 2004 film *Troy*.)

But for archaeologists, a Greek cave that has sparked comparisons to Hades looks more like heaven. Overlooking a quiet Greek bay, Alepotrypa Cave contains the remains of a Stone Age village, burials, a lake and an amphitheater-sized final chamber that saw blazing rituals take place more than 5,000 years ago. All of it was sealed from the world until modern times, and scholars are only now reporting what lies within.

"What you see there almost cannot be described," says archaeologist Anastasia Papathanasiou of the Greek Ministry of Culture, a director of the Diros Project Team. "There is almost no Neolithic (Stone Age) site like it in Europe, certainly none with so many burials."

So far, her team has uncovered about 160 burials inside the cave, from a time 7,000 to 5,200 years ago (5000 to 3200 BC) when farming first spread to Europe. The lives those farmers led inside and outside the cave, across the remote Mani Peninsula of southern Greece, offer fresh insights into life at the dawn of civilization in Europe.

"They were living in a large village outside the cave," says Mike Galaty of Millsaps College in Jackson, Miss., a co-director of the project's survey efforts with Willam Parkinson of Chicago's Field Museum. "And some were inside too, we think, when the entrance collapsed," Galaty says.

Inside, the cave is covered with a layer of greasy ash, left over from ritual fires that may have marked burials there (and reburials, as many of the skeletons are within ossuaries, stone boxes where remains were placed years after their first burial.) "It is quite dark inside, quite black," Papathanasiou says. "But the state of preservation is excellent."

From that preservation, they know the Stone Age farmers at the site ate a diet heavy in barley and wheat with little meat or fish. Although a full reconstruction of the region's prehistoric climate awaits, they know from plant remains that it was wetter and more forested in ancient times. And analyses of the burial skeletons show people who were not much different physically from those in the Mediterranean today, almost as tall as tall as Greeks today, although they were slightly anemic due to a lack of meat in their diet.

About 31% of the burial skulls display an inherited line where bone plates meet, above the forehead, showing they were related, Papathanasiou says. And the noggins show a lot of signs of healed bumps and cuts, she adds. "They fought a lot."

Who did they fight? "Each other, and other people around them," she says. In a nutshell, the cave contains a record of some of Europe's first property-owners, farmers for whom claims to tillable acres were doubtless life-and-death matters worth fighting over. That also made ownership, signified by elaborate burial rituals for family members, much more worth making a fuss over.

"We don't quite know what was going on with the ritual activities, but it seems they were burning sacrificed animals, smashing pots and other pottery, and building large fires

inside the cave," Galaty says. "It could have been really nasty depending on what they were burning."

Fumes coming out of mystic caves figure in big ways in ancient Greek mythology, such as the classical Oracle of Delphi who foretold the future of kings and empires. Although that was thousands of years ago, around 1400 B.C., after the closure of Alepotrypa Cave, such a relationship was suggested by the Greek archaeologist George Papathanassopoulos, who led excavations at the site starting in the 1970's. He speculated that the ancient Greek notion of Hades, a gloomy and misty home for the dead, may have had its origins in the cave's rituals.

The other thing Papathanassopoulos did was save the cave from the fate of becoming a tourist trap. First re-discovered in 1958 by local people, Greek tourism officials saw it as a cave attraction, carving out walkways with bulldozers, installing trestles and even putting a pontoon boat in the interior lake to help with a light show. ("They had to saw the boat in half and then put it back together to get it through the chamber entrance," Galaty says. "It's still floating there.")

Not protecting the cave immediately, " was a huge lost opportunity, it had been sealed for thousands of years," Papathanasiou says now. However, when archaeologists realized what was at hand there, seeing basket after basket of Stone Age pottery emerging from the cave, they led efforts to keep tourists from trampling the site. "There are still very many intact places where very good science can take place," she adds.

A big push for the Diros project in coming years will be outside the cave, Galaty says, to map the extent of the Stone Age community living around the bay. The peninsula, far from Athens and the hotbeds of Greek archaeology, boasts an isolated history that saw an arms race of tower building ("They wanted to shoot cannons down on their neighbors," Papathanasiou says) in the Middle Ages, and perhaps served as a home for the middle-class subjects of Sparta, one of the famed cities of antiquity, best known today from the 2007 fantasy movie, *300*.

On top of that, "some archaeologists predict there may be a palace from the Mycenaean era" in the area outside the cave, Galaty says, the legendary time when Achilles was still living (if there ever really was one, of course), riding around the besieged walls of Troy (which seems to have lost a war around 1200 B.C.), just before he ever descended to Hades.

"We are going to need a bigger new museum," Papathanasiou says. "We are just getting started bringing this site to the world."

Please visit the site:

<http://www.usatoday.com/tech/science/columnist/vergano/story/2012-02-25/Alepotrypa-Cave-Hades/53237894/1?csp=ip>

SPANISH ARCHAEOLOGISTS' MAKE EGYPTIAN DISCOVERY

ARCHAEOLOGISTS from Jaen University found some 20 mummies and a wooden sarcophagus at a site in Aswan, Egypt.

The team, from Jaen, Granada and London, and led by Jaen University professor, Alejandro Jimenez Serrano, had been digging for more than a month on their fourth excursion to the 4,000-year-old Qubbet el-Hawa necropolis.

The main find is a tomb built for a provincial governor from the XII dynasty (1830BC) and a wooden sarcophagus in which a high-ranking person was buried.

They believe that further investigation will lead them to older levels where there are chambers which may be intact, as the necropolis has been used since 2250BC to bury the area's most prominent figures.

Please visit the site: <http://www.euroweeklynews.com/news/spain/91428-spanish-archaeologists-make-egyptian-discovery>

MAKING A BOAT FIT FOR A KING

Analysis of wooden samples taken from Khufu's second solar boat could determine the appropriate methods of restoration, Nevine El-Aref reports

Japanese scientists and archaeologists taking samples from Khufu's second solar boat

Giza plateau was crowded on Monday as journalists, TV anchors, photographers and antiquities officials flocked to the northern side of King Khufu's Great Pyramid to witness Japanese scientists and archaeologists taking samples from different parts of Khufu's second solar boat, which is still buried in sand after 4,500 years. The boat's wooden beams are to be subjected to laboratory analysis to determine the types of fungi, insects and viruses that are affecting the boat, as well as the amount of deterioration that has taken place, so that an appropriate method can be selected to restore it and place it on display beside King Khufu's first boat, which is on display in a museum especially constructed for it on the plateau.

"This is the third phase of the five-year project to restore Khufu's second boat," Minister of State for Antiquities Mohamed Ibrahim who told journalists. The first phase began 20 years ago, when in 1992 a Japanese scientific and archaeological team from Waseda University in collaboration with the Japanese government, offered a grant of \$10 million to remove the boat from its original pit, restore and reassemble it and put it on show to the public.

The team cleaned the pit of insects, but found that water had leaked from the nearby museum which housed the first solar boat. This had affected a small part of the wood, hence the necessity quickly to finish the studies and restore the wood. The Japanese team, under the direction of Professor Sakuji Yoshimura, inserted a camera through a hole in the chamber's limestone ceiling to transmit video images of the boat onto a small TV monitor on the site. Images screened showed layers of wooden beams and timbers of cedar and acacia, as well as ropes, mats and remains of limestone blocks and small pieces of white plaster. The camera allowed an assessment of the boat's condition and the possibility of restoration.

A large hanger has been constructed over the area surrounding the second boat pit, with a smaller hanger inside to cover the top of the boat itself. The hangers were designed to protect the wooden remains during analysis and treatment. A laser scanning survey also documented the area and the wall between the Great Pyramid and the boat pit.

According to Yoshimura while the fillings around the sides of the covering stone were being cleaned the team uncovered the cartouche of King Khufu of the Fourth-Dynasty inscribed on one of these blocks, and beside it the name of the crown prince Djedefre. This, he argued, meant that this boat was constructed during the reign of King Khufu and not, like the first boat now on display at a special museum on the plateau, during the reign of his son and successor Djedefre.

Yoshimura said that restoration and reconstruction work would last for five years. A special small museum will be constructed for it at the entrance of the Giza plateau on the

Cairo-Fayoum road, while the first boat will be transferred to the planned Grand Egyptian Museum.

The second boat was in a much better state of preservation than was the first when it was discovered in 1954, when Egyptian architect and archaeologist Kamal El-Malakh together with Zaki Nour were carried out routine cleaning on the south side of the Great Pyramid. The first boat was removed piece by piece under the supervision of the master of restorers Ahmed Youssef, who spent more than 20 years restoring and reassembling the boat. The second boat remained sealed in its pit up until 1987, when it was examined by the American National Geographic Society in association with the Egyptian office for historical monuments. They bored a hole into the limestone beams that covered it and inserted a micro camera and measuring equipment. The void space over the boat was photographed and air measurements taken, after which the pit was resealed.

It was thought that the pit had been so well sealed that the air inside would be as it had been since ancient Egyptian times, but sadly this was not the case, as air had leaked into the pit and mixed with the air inside it. This had allowed insects to thrive and affect some parts of the wooden beams.

Please visit the site: <http://weekly.ahram.org.eg/2012/1086/eg72.htm>

FOUND: ANCIENT WARRIOR'S HELMET, OWNER UNKNOWN, BY OWEN JARUS

A Greek bronze helmet, covered with gold leaf and decorated with snakes, lions and a peacock's tail (or palmette), has been discovered in the waters of Haifa Bay in Israel. But how this helmet ended up at the bottom of the bay is a mystery.

The helmet dates back around 2,600 years and likely belonged to a wealthy Greek mercenary who took part in a series of wars, immortalized in the Bible, which ravaged the region at that time.

Archaeologists believe that he likely fought for an Egyptian pharaoh named Necho II.

Dredging discovery

The helmet was discovered accidentally in 2007 during commercial dredging operations in the harbor. After it was discovered, conservators with the Israel Antiquities Authority went to work cleaning it and archaeologists began to analyze it.

They discovered that it is very similar to another helmet found in the 1950s near the Italian island of Giglio, about 1,500 miles (2,300 kilometers) away. That helmet has been dated to around 2,600 years ago, something which helped the researchers arrive at a date for the Haifa Bay helmet.

"The gilding and figural ornaments make this one of the most ornate pieces of early Greek armor discovered," writes Jacob Sharvit, director of the Marine Archaeology Unit with the Israel Antiquities Authority, and John Hale, a professor at the University of Louisville, in a summary of their research being presented at the meeting.

This Greek warrior likely would have been a very wealthy individual, as few soldiers could afford such an ornate helmet. The researchers aren't sure where the helmet was made, though they suspect the warrior could be from one of the Greek colonies in Ionia, on the west coast of modern-day Turkey. [The History of Human Aggression]

Greek warrior loses helmet

At the time the helmet was made, circa 600 B.C., Greek colonies dotted the Mediterranean coast, stretching from the Black Sea to southern France. Even so, there is no evidence of Greek colonies in Israel, indicating the warrior who ventured into Haifa Bay was likely the leader of a group of Greek mercenaries.

This warrior was likely one of Egyptian pharaoh Necho II's troops, which he sent through Israel accompanied by a fleet of ancient ships.

The pharaoh was heavily involved in military campaigns in the region for nearly a decade, operations in which this warrior and his group likely were involved.

"They were not fighting for the Greeks, they were fighting for Egypt," Sharvit told LiveScience in an interview.

The series of wars engulfed Egypt, Judah (a Jewish kingdom), Assyria and Babylon, with Necho II of Egypt intervening on the side of Assyria.

The end result of these conflicts was the conquest of Judah and the rise of a resurgent Babylon led by King Nebuchadnezzar II. These events would be immortalized in the Torah (the Christian Old Testament).

At some point, amidst all this history, the elite Greek warrior's helmet ended up at the bottom of Haifa Bay.

Bottom of the harbor

The simplest (albeit most embarrassing) explanation is as to how the helmet ended up at the bottom of Haifa Bay is that somebody dropped it while the warrior's ship was sailing into the harbor.

Another possibility is that the ship carrying the warrior sank, suggesting an ancient shipwreck awaits discovery. "We are planning to go back to the same site and to try to locate other (archaeological) material there," Sharvit said.

Yet another possibility (again, an embarrassing one for the warrior) is that the helmet was lost during a retreat after Necho II's armies were defeated by the Babylonians.

The results of the researchers' work were presented in January at the annual meeting of the Archaeological Institute of America. The helmet itself is now on display at the National Maritime Museum in Haifa.

Please visit the site: <http://www.livescience.com/18700-ancient-helmet-greek-warrior.html> [Go there for pix]