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# Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

**- Ιούνιος 2009 -**

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## **ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS**

# **SOUSKIOU-LAONA HUMAN BIOARCHAEOLOGY FIELD SCHOOL, CYPRUS, 12-25 JULY 2009, THE CYPRUS INSTITUTE AND ARCHAEOLOGY, UNIVERSITY OF EDINBURGH**

The Souskiou-Laona Chalcolithic cemetery is one of four discrete Middle Chalcolithic cemeteries in an elongated arc around the settlement of Souskiou-Laona, 2.5 km inland from Palaepaphos, modern Kouklia, in the southwest of the island of Cyprus. The burial facilities and human remains recovered from the Souskiou-Laona cemetery during five seasons of excavations (2001 – 2005) date to *c.* 3000 BC.

Souskiou-Laona cemetery is a topographically well-defined burial precinct, on a rocky outcrop, with views west over the Dhiarizos Valley to the Ktima Lowlands and the Mediterranean, and east to the Troodos Mountains (Crewe *et al.* forthcoming, 2002; Peltenburg 2002, 2003, 2004, forthcoming). The most common tomb type consists of a deep (*c.* 1.5–2 m), sub-rectangular shaft widening to an oval base (*c.* 0.8 x 1.5 m), either with or without a circular cut to receive arrangements of capstones. The mortuary programme at Souskiou-Laona consisted essentially of a multiple burial rite with a degree of secondary treatment, including double and triple burials. In addition to primary burials, the cemetery contains secondary mortuary remains. These multistage treatments typically involve the disarticulation of individuals and the movement of body parts to bone stacks with superimposed skulls.

The archaeological excavations at the Souskiou-Laona cemetery were conducted by University of Edinburgh (Prof. Peltenburg, Dr Crewe). The Souskiou Laona Human Bioarchaeology Field School is directed by Dr Kirsi O. Lorentz (Science and Technology in Archaeology Research Center, The Cyprus Institute).

The analysis of the Souskiou-Laona human skeletal remains has been ongoing during the previous human bioarchaeology field schools arranged in conjunction with the excavation seasons. Now it is time to focus entirely on the inventory and analysis of the human skeletal remains, in the Lemba Archaeological Research Centre (LARC) in the southwest of Cyprus, near Paphos.

As a participant in the Souskiou-Laona Human Bioarchaeology Field School you will be assisting in the post-excavation processing, inventory, and analysis of human skeletal material excavated from this important site during previous field seasons. Souskiou-Laona cemetery is the only Chalcolithic cemetery in Cyprus where human skeletal remains have been excavated, recovered and recorded with the latest bioarchaeological techniques, and thus holds the key to understanding Chalcolithic populations in Cyprus. For further information on the site and the Lemba Archaeological Research Centre (LARC), please see:

<http://www.arcl.ed.ac.uk/arch/field/cyprus2004/report.html>

<http://www.arcl.ed.ac.uk/arch/lemba/homepage.html>

### Further reading

CREWE, L., K. LORENTZ, E. PELTENBURG AND S. SPANOU forthcoming: Treatments of the dead: preliminary report of investigations at Souskiou-Laona Chalcolithic cemetery, 2001-2004, *Reports of the Department of Antiquities, Cyprus (RDAC)*, 2005.

CREWE, L., E. PELTENBURG AND S. SPANOU 2002: Contexts for cruciforms: figurines from prehistoric Cyprus, *Antiquity* 76, 21–2.

PELTENBURG, E. 1993: Souskiou-Laona, 730–2 in D. Christou, *Chronique des fouilles à Chypre en 1992, Bulletin de Correspondance Hellénique* 117.

PELTENBURG, E. 2002: Souskiou-Laona, 725–6 in S. Hadjisavvas, *Chronique des fouilles à Chypre en 2001, Bulletin de Correspondance Hellénique* 126.

PELTENBURG, E. 2003: Souskiou-Laona, in S. Hadjisavvas, *Chronique des fouilles à Chypre en 2002, Bulletin de Correspondance Hellénique* 127, 2003.

PELTENBURG, E. 2004: Souskiou-Laona, in S. Hadjisavvas, *Chronique des fouilles à Chypre en 2003, Bulletin de Correspondance Hellénique* 128, 2004.

PELTENBURG, E. (ed.) forthcoming: *The Chalcolithic Cemetery of Souskiou-Vathykakas, Cyprus. Results of the Investigations of Four Missions, from 1950 to 1997*. Nicosia: Department of Antiquities.

**Costs:** The Cyprus Institute/STARC has made a substantial contribution towards the costs of the field school (including cost of tuition), and the University of Edinburgh provides basic accommodation at LARC (please see below). Therefore, the costs incurred by the field school participants during their stay in Cyprus consist solely of their own food costs. A cooking rota will be organised, and those field school participants wishing to take part in this rota are requested to come prepared to contribute c. 250-300 Euros to cover *their own food costs* for the duration of the field school. Each field school student is required to arrange and pay for their *own flights and travel* to the Lemba Archaeological Research Centre (in the Lemba village, nearest international airport: Paphos), *any visa if required* (UK and EU citizens do not require one), *travel and medical insurance*, and any costs incurred during any recreational trips during any days off they wish to make.

**Accommodation:** LARC is our base camp. The centre is located in the village of Lemba, 4km from Paphos. The centre has open-air, rooftop sleeping facilities, workroom, showers and kitchen. Mattresses are provided but students are requested to provide their own sleeping bag, linen and pillow. There is room in the garden for the pitching of tents (BYO), and those who require a little more personal space may choose this option. Students are requested to bring a water bottle, sunhat, sunblock, insect repellent, sturdy walking boots, clothing for both warm/hot and cold weather, lightweight sandals/flip flops, own towels, and a sliding calliper, and a cloth tape measurer. There is a fully equipped supermarket only 5 minutes walk from the centre.

**Other information:** It is important to realise that the weather in July in Cyprus is hot. It will be necessary for students to bring clothing and other supplies (such as sun screen, hat, etc) suitable for hot weather conditions, and to be reasonably fit and very enthusiastic. Cyprus has two airports: Larnaca and Paphos. Paphos airport is much closer

to Lemba but those wishing to spend time travelling in Cyprus before or after the field school may wish to fly into Larnaca.

Please ensure you have a current Anti-tetanus vaccination. Further information will be supplied upon acceptance to the field school.

### **Requirements**

You should

- have a good knowledge of human skeletal anatomy, and be able to reliably identify human skeletal elements
- be responsible and independent, taking responsibility for your own work, and willing to work the hours required to complete the work
- be enthusiastic and able to work in an international team
- be willing to adjust to new cultural environments and culinary variety
- be able to commit yourself to the full length of the field school

**Cultural awareness:** You are expected to conduct yourself with a manner that reflects well on the project, taking into account local customs and sensibilities.

### **Applications**

To apply, please complete the attached application form and send it together with an up-to-date CV to Dr Kirsi O. Lorentz ([k.o.Lorentz@cyi.ac.cy](mailto:k.o.Lorentz@cyi.ac.cy)). Please indicate your *initial interest ASAP*, and **definite participation by Monday 1st June 2009 by 4 pm (GMT) at the very latest. Please note that you should apply as early as possible - places are limited.**

\*\*\*\*\*

### **Further information**

Dr Kirsi O. Lorentz ([k.o.lorentz@cyi.ac.cy](mailto:k.o.lorentz@cyi.ac.cy))

Science and Technology in Archaeology

Research Center (STARC),

The Cyprus Institute

([www.cyi.ac.cy](http://www.cyi.ac.cy)),

P.O. Box 27456,

Nicosia, Cyprus

and

School of Historical Studies,

Newcastle University

\*\*\*\*\*



### APPLICATION FORM

*Please return via email (k.o.lorentz@cyi.ac.cy) or fax (+357-22208625), with a hardcopy to follow by post (Dr Lorentz, STARC, The Cyprus Institute, P.O.Box 27456, Nicosia, Cyprus)*

**Souskiou-Laona Human Bioarchaeology Field School  
12-25 July 2009, Cyprus**



&

**Archaeology, University of Edinburgh**

<b>Name</b>	
<b>Email address</b>	
<b>Telephone number (mobile preferred)</b> for quick contact during May/June 2009	
<b>Referee</b> (please give the <b>name</b> and <b>position</b> of the person who you have asked to provide a reference for you)	
<b>Referee's address &amp; email</b>	Address:  Email:
<b>Special dietary requirements</b> (note that it may not be possible to cater for all special dietary requirements in a Cypriot village)	
<b>Medical conditions</b> (for Health and Safety reasons you must state all medical and/or health conditions that may affect you during the project)	
<b>Previous excavation experience</b> (please state project, exact dates, country, name of project director, and briefly describe the tasks you conducted – please attach an additional sheet if required)	
<b>Previous experience of human skeletal analysis:</b> (please state project, exact dates, country, name of project director, and briefly describe the tasks you conducted – please attach an additional sheet if required)	

**I hereby declare that if offered a place on the Souskiou-Laona Human Bioarchaeology Field School I will accept it for the full duration of the field school, and will not fail to take part in the field school.**

**Date:**

**Signature** (electronic; hardcopy to follow):

**THE INSTITUTE OF ARCHAEO-  
METALLURGICAL STUDIES (IAMS)**  
**SUMMER SCHOOL ON ANCIENT  
MINING AND METALLURGY, UCL**  
**INSTITUTE OF ARCHAEOLOGY**

Dear All,

The Institute of Archaeo-Metallurgical Studies (IAMS) is traditionally organizing a Summer School on ancient mining and metallurgy. This usually takes place at the UCL Institute of Archaeology, sometime in June/July, usually for 2 weeks, and gathers both students and professionals with interest in archaeometallurgy (you can also check [www.ucl.ac.uk/iams/](http://www.ucl.ac.uk/iams/)).

This year, the Summer School will be held in **Beijing, China**, in collaboration with the University of Science and Technology Beijing, Institute for Historical Metallurgy and Materials, from 18<sup>th</sup> July to 31<sup>st</sup> July, 2009. It will have a mixed European / Western and Chinese audience, and also mixed teaching.

**Program (preliminary):** We expect students to arrive on Sunday 19 July midday-ish (ie on an overnight flight from Europe leaving Saturday evening; other times may apply for non-European flights). On Monday 20 we are invited to attend a locally organised one-day conference on cast iron, in English, but not as a taught programme; this gives our own teachers and students a day to acclimatise. Tuesday to Thursday will be **mining archaeology**; Friday, Saturday and Sunday are currently earmarked for sight seeing (Great Wall, Palace Museum, shopping). Mon 27 July to Thu 30 covers **smelting and metallurgy**, with return flights pencilled in for Fri 31 July noon-ish, arriving back in Europe the same evening (local time).

**Costs and funding.** We have been successful in obtaining a grant to support the organisation of this school from the UK Research Council's China Office. This allows us to support the local accommodation costs & food during teaching days for successful participants from the UK (and unfortunately from the UK only). Expected costs for all other participants are c GBP 700.- for accommodation and food during the two weeks; in addition, all participants will have to pay for their international flight (c £600 from London). Accommodation will be provided locally on campus, incl. food during teaching days only. Participants are expected to arrange for their own food during the weekends, and for entry fees to museums and public sites such as the Great Wall.

**Places are limited**, particularly for the UK-based funding. Please submit your application for participation as a matter of urgency to me ([th.rehren@ucl.ac.uk](mailto:th.rehren@ucl.ac.uk) or Miljana Radivojevic [m.radivojevic@ucl.ac.uk](mailto:m.radivojevic@ucl.ac.uk) ). If you want to apply for the funding support please **include a brief statement of your current educational status as a student at a UK university**, and your particular interests related to this Summer School.

In order to sort out visas, flights etc. it would be good if you *replied by the mid of May at the latest* please. Should you have any questions regarding this workshop, particularly in regards to funding and overall costs, don't hesitate to ask Miljana or me ([m.radivojevic@ucl.ac.uk](mailto:m.radivojevic@ucl.ac.uk)).

Best wishes,

Thilo

\*\*\*\*\*

Professor Thilo Rehren  
Chair, Archaeological Materials and Technologies  
UCL Institute of Archaeology  
31-34 Gordon Square  
London WC1H 0PY  
Great Britain

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# **CALL FOR PAPERS: CURRENT RESEARCH IN EGYPTOLOGY XI LEIDEN UNIVERSITY, 5TH – 8TH JANUARY, 2010**

After having been held in the UK for the past 10 years, the CRE graduate conference will move to the continent for the first time in 2010.

We are pleased to announce that CRE XI will be held from 5th – 8th January 2010 at Leiden University, The Netherlands. As always, the main aim of the conference is to provide graduate and post-graduate students the opportunity to present their research.

## **Topics**

You are most welcome to present topics from all periods from the Palaeolithic to the Graeco-Roman and Coptic Periods in Egypt and the Sudan. Main themes may include:

- \* Art history
- \* Artefact Studies
- \* Burial Practices and Provisioning for the Afterlife
- \* Current Fieldwork
- \* Economy and Sociology
- \* History and Chronological Studies
- \* Linguistics and Philology
- \* Museology
- \* Religion
- \* Theory and Methods

## **Range of subjects**

It appeared to be particularly interesting to the organizing committee to broaden the scope of the conference and include a section on Modern Egypt. Needless to say, topics should be Egyptology-related. For example, scholars studying the modern perception of the ancient past are encouraged to submit a paper

## **Contributions**

Please note that the language of the conference is English.

Submissions are accepted as a 20 minute paper presentation or as poster presentation (max. format A0)

## **Submitting papers**

An abstract (max 200 words and in English only) and completed registration form, available at the CRE website, should be submitted before the 1st of October 2009 to [Leiden2010@current-research-egyptology.org.uk](mailto:Leiden2010@current-research-egyptology.org.uk). You should receive a confirmation e-mail after submission. The registration form for paper submission could be found on our website: <http://www.current-research-egyptology.org.uk>. A notification will be sent to those selected for presentation before the 1st of November.

With kind regards,

\*\*\*\*\*

The CRE XI organizing committee  
Current Research in Egyptology XI  
Faculty of Humanities  
Leiden Institute for Area Studies, Egyptology Witte Singel 25 / M. de Vrieshof 4 (room  
nr. 208a)  
2311 BZ Leiden  
The Netherlands

\*\*\*\*\*

**Please visit the site: <http://www.current-research-egyptology.org.uk/> [Go there for  
links]**



**END OF AN ERA: IN CELEBRATION OF  
GERRY MCDONNELL AT BRADFORD  
UNIVERSITY FOLLOWED BY A 2 DAY  
HISTORICAL METALLURGY SOCIETY  
RESEARCH IN PROGRESS MEETING,  
UNIVERSITY OF BRADFORD, 10<sup>TH</sup>-12<sup>TH</sup>  
NOVEMBER 2009**

**Call for Papers**

Dr Gerry McDonnell has taken one of the voluntary redundancy packages available to staff at the University of Bradford's Division of Archaeological Science. This is a huge shame for the university which is losing one of their longest standing archaeological scientist, and their only archaeometallurgist. This is also a huge change for Gerry who has been associated with Bradford University for over 30 years.

The overall aim of this conference is to therefore celebrate the research carried out by Gerry McDonnell during his time at Bradford, and to wish him well for his future research. The first day 'End of an Era' will focus on research carried out at Bradford University, bringing back many students and researchers associated with Gerry and Bradford. Following this day the Historical Metallurgy Society invites everyone to a two day Research in Progress Meeting. This is an opportunity for anyone to present the results from current historical metallurgy or archaeometallurgy research in progress, in a friendly and supportive environment.

**Conference Themes**

Everybody knows that Gerry McDonnell's primary interest is iron and slag but during his time at Bradford University he has carried out a huge variety of projects on both ferrous and non-ferrous alike. Therefore a wide variety of papers will be considered; including iron and steel, non-ferrous metals, slag analysis, experiments as well as more theoretical or archaeological based papers. As long as the paper covers some aspect of archaeometallurgy they are welcome here.

***1) Smelting through the Ages***

This can cover everything from prehistoric smelting across the globe to post-medieval blast furnaces in the United Kingdom, and everything between. Studies of ironworking waste will be particularly welcome; to reflect Gerry McDonnell's love of slag.

***2) Smithing and Non-Ferrous Metalworking through the Ages***

This session hopes to cover all aspects of the manufacture of artefacts, be they ferrous or non-ferrous. This theme can include topics including analysis of smithing slags,

metallographic studies, investigations of metalworking workshops and more theoretical and historical discussions of the metalworkers themselves.

Papers are welcome from a variety of people, and will be particularly welcome from commercial archaeologists at all levels of seniority, academic researchers (including masters, doctoral or post-doctoral students) and independent researchers including local study groups and community archaeology programmes.

### **Papers**

The conference language will be English. Each presentation will be between 15 to 25 minutes (depending on the number of papers received) with time for questions after each presentation.

There will be room available for up to 40 posters. During the conference there will be formal time allocated for posters, plus each poster presenter will be allocated one minute to introduce their poster (with the aid of one OHP) during the conference. The maximum size for posters is A0 (841 x 1189mm – upright/portrait format).

Abstracts of papers and posters for the book of abstracts should be submitted by June 19<sup>th</sup>, 2009. The abstracts should be sent by e-mail to Eleanor Blakelock ([Eleanor.Blakelock@ironsmelting.net](mailto:Eleanor.Blakelock@ironsmelting.net)) in Word for Windows format and should be no longer than 500 words, and/or fit onto one page. To facilitate administration please format abstract text to single spaced Arial 11pt with the title in bold capital letters 12pt and the name and affiliation of the presenting author in bold letters. Also please add your name to the abstract filename. In the email please indicate whether you are a current student and/or whether you were/are a student of Gerry McDonnell.

Alternatively you can send abstracts via snail mail to me using the address below

Eleanor Blakelock  
Division of AGES  
University of Bradford  
West Yorkshire  
BD7 1DP  
UK

### **Publication**

It is hoped that a selection of papers (and posters) from this conference will be published by Historical Metallurgy Society.

### **Cost**

The conference cost includes all coffee and tea breaks, lunches on all three days and the conference dinner on Wednesday 11<sup>th</sup> November.

#### ***Early Birds (Booking before August 31<sup>st</sup>)***

General Participant	£100
HMS Member	£85
Student	£70

Day rate £30 (add £20 for conference dinner on Wednesday night)

***Bookings after August 31<sup>st</sup>***

General Participant	£130
HMS Participant	£115
Student	£100
Day rate	£40 (add £20 for conference dinner on Wednesday night)

**Fieldtrips**

On Friday the 13<sup>th</sup> of November there will be an organised field trip. The focus of this trip is to visit Rievaulx Abbey, and to look at the blast furnace landscape. We may also include a visit to Helmsley Castle as it would be a good place for lunch. We are hoping to arrange a trip to Bilsdale to look at some of the other metallurgy sites, but these sites are less accessible and dependant on local farmer's permission, resulting in only limited places available. Prices to be confirmed at a later date.

**Key Dates**

Abstract due date	June 19 <sup>th</sup>
Decision on abstracts & provisional programme	July 1 <sup>th</sup>
Full programme	July 13 <sup>th</sup>
Early Bird	August 31 <sup>st</sup>
Changes to abstracts	October 9 <sup>th</sup>

**Enquiries to**

Eleanor Blakelock – [Eleanor.Blakelock@ironsmelting.net](mailto:Eleanor.Blakelock@ironsmelting.net)

Or write to me using the address below

Eleanor Blakelock  
Division of AGES  
University of Bradford  
West Yorkshire  
BD7 1DP  
UK

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**BONES, BEHAVIOUR AND BELIEF. THE  
OSTEOLOGICAL EVIDENCE AS A  
SOURCE FOR GREEK RITUAL  
PRACTICE, SWEDISH INSTITUTE AT  
ATHENS, 10<sup>TH</sup>-12<sup>TH</sup> SEPTEMBER 2009**

The Swedish Institute at Athens is organizing a conference entitled "Bones, behaviour and belief. The osteological evidence as a source for Greek ritual practice". The event will take place in Athens, on the 10th-12th of September 2009.

The purpose of the conference is to highlight the role and contribution of the osteological evidence for our understanding of Greek sacrificial ritual, especially from a methodological perspective. It also aims at a discussion of the relation of the bone material to other source categories – texts, inscriptions, images and archaeological remains other than bones.

Of central interest are issues approachable from osteological evidence only and instances where the bone material presents a picture different from that derived from the written or pictorial sources. A group of prominent osteologists working on evidence from sanctuaries and cult places will present papers addressing questions of ritual practices. To stimulate an increased integration of osteology in the study of Greek cult in the future and to highlight the relation of various categories of sources to each other, a panel of leading scholars working on Greek religion mainly thought the use of non-osteological material will participate in the discussions as well as in the concluding table ronde.

Confirmed speakers include Gerhard Forstenpointner (Wien), Gunnel Ekroth (Stockholm), Valasia Isaakidou (Sheffield), Paul Halstead (Sheffield), Maria Vretemark (Museum of Västergötland), Armelle Gardeisen (Latté), Michel MacKinnon (Winnipeg), Dimitra Mylona (Rethymnon), François Poplin (Paris), Ola Magnell (Lund), Martine Leguilloux (Var), Hélène Siard (Paris), Sabine Sten (Gotland), Emmanulle Vila (Lyon).

Invited discussants: Robin Hägg (Göteborg), Stella Georgoudi (Paris), Scott Scullion (Oxford), Francis Prost (Paris), Véronique Mehl (Rennes).

The conference will be held at the Italian School, Athens and all interested listeners are welcome to attend.

For further information, please contact [gunnel.ekroth@antiken.su.se](mailto:gunnel.ekroth@antiken.su.se) or [jenny.wallenstein@sia.gr](mailto:jenny.wallenstein@sia.gr)

\*\*\*\*\*  
Jenny Wallenstein, PhD

Assistant Director, Swedish Institute at Athens Mitseon 9 GR 117 42 Athens Greece

Tel. +30 210 924 3114

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**TURKEY AND THE BYZANTINE,**  
**INSTITUTE OF CLASSICAL STUDIES**  
**BYZANTINE COLLOQUIUM 2009, 13<sup>TH</sup>**  
**JUNE, LUCAS THEATRE, STRAND**  
**BUILDING, KING'S COLLEGE, UK**

The recent success of the *Byzantium 330-1453* exhibition at the Royal Academy has greatly increased interest in, and awareness of, Byzantine civilisation; In particular the exhibition threw light on its inheritance in other cultures. The purpose of this colloquium is to present in London, for the first time, some of the spectacular new discoveries from current excavations in Istanbul (see, for example, the recent [BBC report](#) on the neolithic finds, and a recent [article](#) on the harbour finds). These have increased our understanding both of the Byzantine and of the pre-Byzantine city; we will also explore the theme of the post-Byzantine heritage of the City, and look forward to the role of Istanbul as European Capital of Culture 2010.

The Colloquium is being convened by [Professor Judith Herrin](#). It will take place on Saturday, 13th June, in the Lucas theatre, Strand Building, King's College: see [campus plan](#)

Attendance is open to all, including King's alumni attending the [Alumni Weekend](#).

**Acknowledgements**

This is the annual Byzantine colloquium sponsored by the Institute of Classical Studies. This particular event has been made possible by the generous support of the Embassy of the Republic of Turkey, and the friendly collaboration of colleagues at the School of Oriental and African Studies, and at Royal Holloway College.

**Programme**

10.45 Welcome: Professor Judith Herrin (King's College London, University of London)

**New Discoveries in Byzantium**

11.00 Professor Sevil Gülçur (Department of Prehistory, Istanbul University): *Prehistory Sealed by the Sea. Recent Neolithic Discoveries from the Byzantine Harbour of Istanbul*

12.00 Professor Cemal Pulak (Nautical Archaeology Program, Department of Anthropology, Texas A&M University): *Recent Excavations at Yenikapi, Istanbul-Turkey: Shipwrecks of Portus Theodosiacus, the Byzantine Port of Constantinople.*

Lunch break

**Afternoon**

**Byzantium in Turkey**

14.30 Dr Jonathan Harris (Department of History, Royal Holloway, University of London): *A lost Byzantine church: Envisaging the Perivleptos (Sulu Manastir)*

15.00 Professor Dr Alessandra Ricci (Department of Archaeology and History of Art, Koç University, Istanbul): *Giving back Byzantine spaces: recent discoveries in the Asian suburbs of Istanbul*

15.30 Dr Yorgo Dedes (School of Oriental and African Studies, University of London): *"Byzance après Byzance" or The 'Rum connection' in the Ottoman empire*

16.30 Professor İlber Ortaylı (Topkapi Museum, Istanbul) *Byzantium's heritage and the Ottoman Empire*

17.30 Byzantium in Istanbul 2010: A round table discussion

### **Practical**

Attendance is open to all. For further information please email [bmg@kcl.ac.uk](mailto:bmg@kcl.ac.uk)

Please visit the site: <http://www.kcl.ac.uk/schools/humanities/depts/bmg/news/byz-turkey.html>

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## **"ΕΚΠΑΙΔΕΥΤΙΚΕΣ ΔΡΑΣΕΙΣ ΓΙΑ ΤΗΝ ΠΟΛΙΤΙΣΤΙΚΗ ΚΛΗΡΟΝΟΜΙΑ ΚΑΙ ΤΟ ΠΕΡΙΒΑΛΛΟΝ 2008-2009", 26 ΙΟΥΝΙΟΥ 2009, ΑΘΗΝΑ, ΙΣΤΟΡΙΚΟ ΑΡΧΕΙΟ ΤΗΣ ΕΘΝΙΚΗΣ ΤΡΑΠΕΖΑΣ ΤΗΣ ΕΛΛΑΔΑΣ**

**ΔΙΕΘΝΕΣ ΣΥΜΒΟΥΛΙΟ ΜΟΥΣΕΙΩΝ (ICOM) – ΕΛΛΗΝΙΚΟ ΤΜΗΜΑ**

**Αγ. Ασωμάτων 15, Αθήνα 10553, 210 3239414**

Πληροφορίες:

Αμαλία Τσιτούρη

Εκπρόσωπος του Ελληνικού Τμήματος του ICOM

στην Επιτροπή ICOM - CECA

τηλ. / φαξ 210 – 8847082, 697 2828712

Αθήνα, 12/5/2009

Αγαπητοί συνάδελφοι,

Θα θέλαμε να σας ενημερώσουμε ότι η Ομάδα Εργασίας του CECA (Committee for Education and Cultural Action) του Ελληνικού Τμήματος του ICOM προγραμματίζει, για δεύτερη συνεχή χρονιά, Ημερίδα με τίτλο **"Εκπαιδευτικές δράσεις για την πολιτιστική κληρονομιά και το περιβάλλον 2008-2009"**, με στόχο την παρουσίαση των νέων δράσεων που σχεδιάστηκαν ή πραγματοποιήθηκαν για πρώτη φορά κατά το τρέχον ακαδημαϊκό έτος.

Στο πλαίσιο της Ημερίδας θα παρουσιαστούν εκπαιδευτικά προγράμματα σε μουσεία, μνημεία, αρχαιολογικούς ή ιστορικούς τόπους της ελληνικής επικράτειας, εκπαιδευτικά έντυπα, μουσειοσκευές, εκπαιδευτικές ψηφιακές εφαρμογές και ειδικές δράσεις.

Η Ημερίδα θα πραγματοποιηθεί την **Παρασκευή 26 Ιουνίου 2009**, στην Αθήνα, στο κτίριο του Ιστορικού Αρχείου της Εθνικής Τράπεζας της Ελλάδας (Μέγαρο Διομήδη, 3<sup>ης</sup> Σεπτεμβρίου 146) και θα είναι ανοικτή στο κοινό. Οι ομιλίες θα δοθούν, κατά κύριο λόγο, από μέλη του Ελληνικού Τμήματος του ICOM (άτομα και εκπροσώπους φορέων) που δραστηριοποιούνται στο πεδίο της μουσειακής εκπαίδευσης, και θα έχουν **διάρκεια 10 λεπτών**. Στο πλαίσιο της Ημερίδας θα υπάρξει η δυνατότητα προβολής σχετικού οπτικοακουστικού υλικού, καθώς και η δυνατότητα έκθεσης εκπαιδευτικού υλικού (έντυπα, μουσειοσκευές, παιχνίδια κλπ).

Ως εκ τούτου, και για τον καλύτερο δυνατό σχεδιασμό του προγράμματος της Ημερίδας, παρακαλούνται όσοι ενδιαφέρονται να συμμετάσχουν με ή χωρίς ομιλία, ή επιθυμούν να παρουσιάσουν κάποιο εκπαιδευτικό υλικό, **να συμπληρώσουν το συνημμένο έντυπο και να το αποστείλουν ηλεκτρονικά στη διεύθυνση [amalia.tsitouri@yahoo.gr](mailto:amalia.tsitouri@yahoo.gr) το αργότερο μέχρι την Τρίτη 26 Μαΐου 2009.**

Ελπίζουμε ότι η και η φετινή διοργάνωση θα αποτελέσει μια σημαντική ευκαιρία για ενημέρωση και γόνιμη ανταλλαγή απόψεων μεταξύ των μελών του ICOM και γενικότερα όσων ενδιαφέρονται για τα ζητήματα της μουσειακής εκπαίδευσης στην Ελλάδα.

Για το Δ.Σ.

Η Πρόεδρος

Σουζάνα Χούλια- Καπελώνη

Η Γραμματέας

Αγγελική Κόκκου

## ΕΝΤΥΠΟ ΣΥΜΜΕΤΟΧΗΣ

**ΟΝΟΜΑΤΕΠΩΝΥΜΟ ΟΜΙΛΗΤΗ:** \_\_\_\_\_  
**ΕΙΔΙΚΟΤΗΤΑ:** \_\_\_\_\_  
**ΙΔΙΟΤΗΤΑ:** \_\_\_\_\_  
**ΦΟΡΕΑΣ:** \_\_\_\_\_  
**Δ/ΝΣΗ:** \_\_\_\_\_  
**ΤΗΛ:** \_\_\_\_\_  
**ΦΑΞ:** \_\_\_\_\_  
**E-MAIL:** \_\_\_\_\_

**Επιθυμώ να συμμετάσχω στην ημερίδα που διοργανώνει η Ομάδα Εργασίας του ICOM-CECA, στις 26 Ιουνίου 2009 και συγκεκριμένα:**

**A.** Να παρακολουθήσω την ημερίδα, χωρίς να πραγματοποιήσω οποιοδήποτε είδους παρουσίαση

\_\_\_\_\_

**B.** Να πραγματοποιήσω **10λεπτη παρουσίαση** για τις τρέχουσες εκπαιδευτικές δράσεις του φορέα μου (προγράμματα, μουσειοσκευές, έντυπα κ.λ.π.).  
Η παρουσίαση θα έχει τίτλο

\_\_\_\_\_

\_\_\_\_\_

**Γ.** Να προβάλω **Ο/Α υλικό** (CD / DVD) διάρκειας \_\_\_\_\_ λεπτών  
με τίτλο \_\_\_\_\_

\_\_\_\_\_

**Δ.** Να εκθέσω εκπαιδευτικό υλικό και συγκεκριμένα (είδος υλικού/τίτλος)

\_\_\_\_\_

\_\_\_\_\_

Τα **τεχνολογικά μέσα** που θα χρειαστώ είναι (\* διευκρινίστε τόσο το **μέσον**, όσο και το **απαραίτητο λογισμικό**, π.χ. Power Point σε Microsoft Office 2003, Windows Vista ή DVD που ανοίγει με Windows Media Player)

\_\_\_\_\_

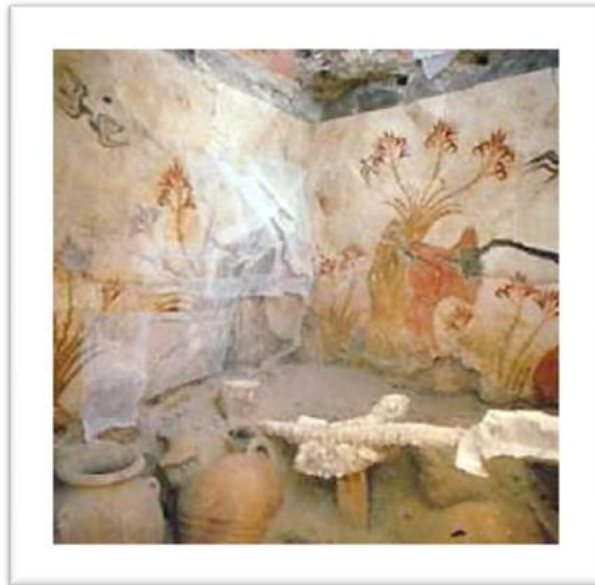
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# ΑΚΡΩΤΗΡΙ ΘΗΡΑΣ: ΑΡΧΙΤΕΚΤΟΝΙΚΗ, ΤΟΙΧΟΓΡΑΦΙΕΣ ΚΑΙ ΕΙΚΟΝΟΓΡΑΦΙΚΑ ΠΡΟΓΡΑΜΜΑΤΑ ΤΟΥ ΥΣΤΕΡΟΚΥΚΛΑΔΙΚΟΥ Ι ΟΙΚΙΣΜΟΥ

ΔΙΑΛΕΞΗ του Δρ. ΑΝΔΡΕΑ ΒΛΑΧΟΠΟΥΛΟΥ  
Επίκουρος Καθ. του Πανεπιστημίου Ιωαννίνων

Πέμπτη 4 Ιουνίου, 11.00

στο Αμφιθέατρο του Τμήματος Συντήρησης Αρχαιοτήτων & Έργων Τέχνης



Στην ομιλία θα παρουσιαστεί σύντομα η γεωλογική και ιστορική πορεία της Θήρας έως την μεγάλη έκρηξη του 1630 π.Χ., η οποία με αντιφατικό τρόπο κατέστρεψε τον οικισμό του Ακρωτηρίου, αλλά και διατήρησε μοναδικά τα απειράριθμα υλικά τεκμήρια που γνωρίζουμε από αυτόν. Δίνεται ιδιαίτερο βάρος στην πολεοδομική συγκρότηση και την αρχιτεκτονική του οικισμού, και παρουσιάζονται τα σημαντικότερα κτίρια και τα εικονογραφικά προγράμματα των τοιχογραφιών τους, μέσα από τα οποία πλουτίζεται η γνώση μας για τις κοινωνίες του μινωικού, κυκλαδικού και πρώιμου μυκηναϊκού Αιγαίου.

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

**JOB OPPORTUNITIES IN**  
**ARCHAEOLOGICAL SCIENCES;**  
**CLOSING DATE 31ST MAY**

Dear Colleague,

Please find below information on job opportunities (<http://www.cyi.ac.cy/jobs>) at the Science and Technology in Archaeology Research Center (STARC) of the Cyprus Institute ([www.cyi.ac.cy](http://www.cyi.ac.cy)).

Post-Doctoral Fellow in Material and Natural Sciences Applications to Archaeology  
<http://www.cyi.ac.cy/node/232>

Research Assistant in Material and Natural Sciences Applications to Archaeology  
<http://www.cyi.ac.cy/node/233>

Post-Doctoral Fellow in Digital Heritage <http://www.cyi.ac.cy/node/228>

Research Assistant in Digital Heritage <http://www.cyi.ac.cy/node/231>

**Closing date for applications: 31 May 2009.**

I would be grateful if you could circulate this information widely to any interested candidates you may know.

Many thanks for your assistance in advance.

Kind regards,

Kirsi Lorentz

\*\*\*\*\*

Dr Kirsi O. Lorentz  
Science and Technology in Archaeology Research Centre (STARC)  
The Cyprus Institute  
Guy Ourisson Building  
PO Box 27456  
1645 Nicosia  
Cyprus

Tel +357 22208600 (ext 656)  
Fax +357 22208625  
Email [k.o.lorentz@cyi.ac.cy](mailto:k.o.lorentz@cyi.ac.cy)

[www.cyi.ac.cy](http://www.cyi.ac.cy)

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## **CAMS POST-DOC POSITION**

The natural radiocarbon research group at the Center for Accelerator Mass Spectrometry at LLNL has funding for a post-doctoral research position at the nexus of AMS-14C, biogeochemistry, and atmospheric transport modeling. This position is part of a multi-laboratory and multi-agency collaborative project and will entail high-precision ( $\pm 2$  per mil) AMS-14C analyses on atmospheric CO<sub>2</sub> samples. The preferred candidate will have experience in either AMS-14C, stable isotopes (eg.  $\delta^{13}C$ ) or atmospheric chemistry and transport. We anticipate the position being up to a maximum of three years conditional upon mutual acceptable performance and continued funding.

Applications can ONLY be submitted via LLNL's jobs website:

[https://jobs.llnl.gov/prod\\_index.html](https://jobs.llnl.gov/prod_index.html)

External Posting      008398

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## **POSTDOCTORAL RESEARCH FELLOW** **POSITION AT 14CHRONO CENTRE,** **QUEEN'S UNIVERSITY OF BELFAST**

The 14CHRONO Centre for Climate, the Environment and Chronology (<http://www.chrono.qub.ac.uk>), School of Geography, Archaeology and Palaeoecology, Queen's University Belfast, has a postdoctoral research fellow position available for 24 months (with possibility of extension) to assist in research activity using natural abundance AMS <sup>14</sup>C and/or IRMS stable isotope measurements (C,N,O,H,S), such as, but not limited to, carbon dynamics in present or past marine, lacustrine or terrestrial environments or food webs, and to assist in the support of the laboratory's commercial activities.

### Essential Qualifications and Experience:

- PhD in Biogeochemistry, Biology, Botany, Ecology, Earth sciences, Marine sciences or a related discipline
- At least 2 years postdoctoral research experience or equivalent in carbon related research
- Experience with stable isotope mass spectroscopy (EA-IRMS or GC-IRMS)
- Experience with chemical preparations, protocol testing and development
- Publications in peer reviewed journals

### Additional Desirable Experience:

- AMS (any isotope)
- Electronics troubleshooting
- Computer programming (Basic, Fortran, C, C++, R, or Excel macros)
- Statistical analyses
- Utilising radiocarbon data

Ref. 09/100935

Salary: £29,704-£38,757 per annum (including contribution points).

Closing date: 4.00 pm, Friday 3 July 2009

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**RESEARCH ASSOCIATE IN THE  
PROJECT COLONIAL TRADITIONS:  
CERAMIC PRODUCTION IN PUNIC  
SARDINIA, IBIZA AND SICILY, WHICH  
IS PART OF THE LEVERHULME-  
FUNDED RESEARCH PROGRAMME  
TRACING NETWORKS: CRAFT  
TRADITIONS IN THE ANCIENT  
MEDITERRANEAN AND BEYOND'**

The Colonial Traditions project focuses on the production of ceramic coarse wares for domestic and productive purposes in the western Mediterranean Punic world, specifically the island regions of southern Sardinia, western Sicily and Ibiza during the classical period (5th to 2nd c. BCE). Large-scale fabric and technological studies have been carried out at within the Riu Mannu and Terralba rural settlement projects (Sardinia); additional comparative analyses will be done in indigenous contexts in Sardinia and in Punic contexts in Sicily and Ibiza. Throughout the Punic world (as elsewhere in the western Mediterranean), this period saw a massive expansion of rural settlement, accompanied by large-scale use of mostly locally produced domestic pottery (kitchen and cooking wares) and (transport) amphorae. These productions are characterised by a strong adherence to Phoenician-Punic ceramic shapes and appearance, and because they differ markedly from indigenous pottery, they are widely regarded as colonial productions implying the take-over of the indigenous interior regions of these islands.

The aim of this sub-project is to investigate how strong these presumed colonial connections are in terms of the ceramic traditions beyond shape and appearance, focusing in particular on fabrics and manufacturing techniques. Can indigenous artisan traditions be traced in these productions?

Reference Number 00034-2

Location Main Campus (Gilmorehill)

Faculty/ Services Faculty of Arts

Department 100 Archaeology

Job Family Research & Teaching

Position Type Full Time - 4 years

Salary Range £25, 623 - £28,839/£31,513 - £35,469 (grade 6/7)

<http://www22.i->

[grasp.com/fe/tpl\\_glasgow01.asp?s=bkMjPurEcTFkHhTcz&jobid=25303,1234346935&key=867288&c=4012617887&pagestamp=seiumljgvpmmmanjw](http://www22.i-grasp.com/fe/tpl_glasgow01.asp?s=bkMjPurEcTFkHhTcz&jobid=25303,1234346935&key=867288&c=4012617887&pagestamp=seiumljgvpmmmanjw)

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Bernard Knapp

[b.knapp@archaeology.arts.gla.ac.uk](mailto:b.knapp@archaeology.arts.gla.ac.uk)

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## **OPEN POSITION AT THE KCCAMS/UCI FACILITY, SPECIALIST IN TERRESTRIAL CARBON CYCLING**

The Department of Earth System Science/W.M. Keck Carbon Cycle AMS facility has an opportunity for a research Specialist to support research in terrestrial carbon cycling through analyses of radiocarbon and  $^{13}\text{C}$  in organic matter, water and air samples. KCCAMS was established in 2002 with the goal of improving understanding of the Earth's carbon cycle through the use of radiocarbon as a tracer. It supports analyses of research samples from UC campuses and a range of non-UC researchers, and educates the user community through an annual short course. We seek an individual interested in longer-term employment with experience in laboratory geochemical analysis and student supervision who is capable of working as part of a team in an interdisciplinary work environment. Candidates will be expected to participate in research as well as oversee laboratory preparation of samples. Preference will be given to candidates with an advanced degree (minimum of BS) and appropriate experience in radiocarbon and/or stable isotope measurement and data interpretation. The successful candidate will be expected to master all aspects of sample pretreatment, preparation, measurement and data interpretation of radiocarbon by accelerator mass spectrometry, as well as to supervise and train students in the laboratory. Active participation in research projects is encouraged, and sufficient scientific understanding of radiocarbon to offer advice to users will be required.

Salary will be commensurate with experience. Position dependent on extramural funding and the research contracts of individual P.I.'s. Review of applicants will begin in May 2009, though the position will remain open until filled.

Please email a statement of interest, a c.v. and the names of three references to Dr. Xiaomei Xu ([xxu@uci.edu](mailto:xxu@uci.edu)).

The University of California Irvine is an equal opportunity employer committed to excellence through diversity.

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## **FULBRIGHT OPPORTUNITIES IN ARCHAEOLOGY**

From March to August 1, 2009, U.S. faculty and professionals are invited to apply for \*Fulbright scholar grants at [www.cies.org](http://www.cies.org). For monthly updates, write us at [outreach@cies.iie.org](mailto:outreach@cies.iie.org) for a complimentary subscription to *The Fulbright Scholar News*, an electronic newsletter.

*\*The Fulbright Program, sponsored by the U.S. Department of State's Bureau of Educational and Cultural Affairs, is the U.S. government's flagship international exchange program and is supported by the people of the United States and partner countries around the world. Since 1946, the Fulbright Program has provided more than 286,000 participants from over 155 countries with the opportunity to study, teach and conduct research, to exchange ideas and contribute to finding solutions to shared international concerns. For more information, visit <http://fulbright.state.gov/> .*

### **Fulbright Scholar Program for US Faculty and Professionals for 2010-2011 is open**

The Fulbright Scholar Program offers **six grants in lecturing, research or combined lecturing/research awards in archaeology, including one Fulbright Distinguished Chair**. Even better, faculty and professionals in archaeology also can apply for one of the **144 “All Discipline”** awards open to all fields.

What does Fulbright offer in archaeology? Here are a few of the awards for 2010-2011:

**Middle East and North Africa** – Award #0417 – Middle East and North Africa Regional Research Program – 3-9 months in two or more countries

**France** – Award #0251 – French studies (arts and humanities)

**Mauritius** – Award #0080 – Museum and Heritage Studies

**Taiwan** – Award #0181 – Social Sciences and Humanities (archaeology in Southeast Asia and North America)

The application deadline is August 1, 2009. U.S. citizenship is required.

For a full, detailed listing of all Fulbright programs awards and other eligibility requirements visit our website at [www.cies.org](http://www.cies.org), or send a request for materials to [scholars@cies.iie.org](mailto:scholars@cies.iie.org).

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# **RESEARCH FELLOWSHIPS IN THE HUMANITIES (INCL. ARCHAEOLOGY)** **AT THE UNIVERSITY OF SOUTHAMPTON**

I am delighted to say that the School's plans to appoint up to five post-doctoral research fellowships have been accepted. These one-year posts are a result of the School's success in RAE and can be held in any of our seven disciplines. They also reflect our success in generating additional income this year, which the University has agreed to allow us to carry forward to next year.

The posts are now advertised on Jobs.ac.uk  
[http://www.jobs.ac.uk/jobs/FK100/Research\\_Fellowships - Humanities One-year/](http://www.jobs.ac.uk/jobs/FK100/Research_Fellowships_-_Humanities_One-year/)

I am sure that all colleagues will wish to make the posts known widely in our various academic communities so that we shall attract as strong a field as possible. The closing date for applications is 5th June.

Best wishes

Mike

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Professor Michael Kelly  
Head of School

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Yannis Hamilakis  
Reader in Archaeology  
University of Southampton  
SOUTHAMPTON SO17 1BJ, UK

<http://www.soton.ac.uk/archaeology/profiles/hamilakis.html>

[www.theotheracropolis.com](http://www.theotheracropolis.com)

[www.kalaureia.org](http://www.kalaureia.org)

[www.kalaureiainthepresent.org](http://www.kalaureiainthepresent.org)

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## **ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS**

# **AMERICAN JOURNAL OF ARCHAEOLOGY ONLINE REVIEWS** **(APRIL 2009)**

The American Journal of Archaeology (AJA) publishes quarterly public-access book and museum reviews: <http://www.ajaonline.org/index.php?type=oreview>. These reviews are listed in the table of contents of the respective printed issue of the Journal and are available for free download on the Journal's Web site. Below is a list of reviews published in tandem with our printed April 2009 issue (volume 113, number 2). We hope you enjoy.

The Editors

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### Book Reviews

Negotiating the Past in the Past: Identity, Memory and Landscape in Archaeological Research

By Norman Yoffee

Reviewed by Hamish Forbes

[http://www.ajaonline.org/pdfs/book\\_reviews/113.2/01\\_Forbes.pdf](http://www.ajaonline.org/pdfs/book_reviews/113.2/01_Forbes.pdf)

The Human Fossil Record. Vol. 4, Craniodental Morphology of Early Hominids (Genera Australopithecus, Parathropus, Orrorin): an Overview

By Jeffery H. Schwartz and Ian Tattersall

Reviewed by Janet Monge

[http://www.ajaonline.org/pdfs/book\\_reviews/113.2/02\\_Monge.pdf](http://www.ajaonline.org/pdfs/book_reviews/113.2/02_Monge.pdf)

Gender Through Time in the Ancient Near East

By Diane Bolger

Reviewed by Susan Pollock

[http://www.ajaonline.org/pdfs/book\\_reviews/113.2/03\\_Pollock.pdf](http://www.ajaonline.org/pdfs/book_reviews/113.2/03_Pollock.pdf)

Arslantepe Cretulae: An Early Centralised Administrative System Before Writing

By M. Fragipane, P. Ferioli, E. Fiandra, R. Laurito, and H. Pittman

Reviewed by Judith Weingarten

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## **ANTIQUITY ARCHAEOLOGICAL PHOTOGRAPHY PRIZE**

Antiquity invites the submission of high-quality archaeological photographs for publication in the journal.

Two photographs will be selected and published each quarter. A judging panel will decide the best photograph published each year and a cash prize of £500 will be awarded to the winner.

Photographs must be sent as digital images at a minimum width of 135mm @ 300 pixels per inch and a maximum height of 200mm. All photographs should be accompanied by a short caption providing details of the site/artefact, when the image was taken, where the image was taken from, what are the circumstances of the site/find, the date of the site/find and technical specifications of the image.

Portrait orientated images are preferred.

Please send submissions to [editor@antiquity.ac.uk](mailto:editor@antiquity.ac.uk)

Please visit the site: <http://antiquity.ac.uk/events.html> [Scroll down a bit]

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## **ARCHAEOLOGICAL MUSEUM OF CHAERONEIA IN BOEOTIA, GREECE, OPEN TO THE PUBLIC**

Dear all,

The picturesque Archaeological Museum of Chaeroneia in Boeotia, Greece, after restoration and reexhibition works is now open to the public. Its exhibition is devoted to the presentation of the history and archaeology of North Boeotia from the prehistoric times to the Roman Period. Of special interest to the Aegean prehistorians is the Middle Neolithic stuff from the excavations conducted by G. Soteriadis and H. Tzavela-Evjen in Chaeroneia ("Magoula Balomenou"), the Early, Middle and Late Bronze Age material from excavations conducted in Orchomenos by H. Bulle, E. Kunze and the local IX Ephorate of Prehistoric and Classical Antiquities, as well as many other important finds from various old and recent excavations in other sites of the region (Tegyra, Gla, Schisti Odos, Levadeia, Panopeus, Davleia etc). Its visiting days and hours are Tuesday-Sunday, 08:30-15:00.

Ioannis Fappas

Email: [johnfappas@hotmail.com](mailto:johnfappas@hotmail.com)

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## *INTERNET SITES*

### **SIMS-SS OBSIDIAN DATING METHOD** **A NOVEL METHOD FOR DATING** **OBSIDIAN ARTIFACTS**

SIMS-SS (Secondary Ion Mass Spectrometry - Saturation Surface) is a *pioneering dating method* of ancient **obsidian** artifacts based on the modelling of water diffusion profile, using the *Saturation Surface Approach*.

The method makes use of the *SIMS* analytical technique to measure the profile of water concentration, which has been defused perpendicular to the surface, versus Depth. The profile is properly elaborated for the deduction of the age.

This is an analytical presentation of the method, an on-line tool for age calculation and a program download is available.

This project works under the supervision of the *Laboratory of Archaeometry, University of the Aegean, Greece*.

**Please visit the site: <http://www.rhodes.aegean.gr/tms/sims-ss/>**

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## **MEDITERRANEAN ARCHAEOLOGY & ARCHAEOLOGY (MAA)**

The *Mediterranean Archaeology & Archaeometry (MAA)* an interdisciplinary International Journal issued by The University of the Aegean, Department of Mediterranean Studies, Rhodes, Greece. MAA is published since 2001 and from 2008 is operating in updated format.

The *international journal MAA* "Encourage international discussion on the coupling between archaeology and archaeometry in their broader sense, initiating forums of discussion on the establishment of widely accepted criteria of correct approach and solution of particularly current and future archaeological problems."

It focuses in the Mediterranean region and on matters referred to interactions of Mediterranean with neighbouring areas, but presents an international forum of research, innovations, discoveries, applications and meetings, concerning the modern approaches to the study of human past.

The Editors will welcome contributions from all parts of the World.

**MAA** has been selected to be **indexed and abstracted in Arts and Humanities Citation Index (Thompsons Reuters)**, beginning with v.8(1) 2008.

The papers submission rate has been tripled, while the rejection rate remains at about 30%.

Please visit the site: [http://www.rhodes.aegean.gr/maa\\_journal/](http://www.rhodes.aegean.gr/maa_journal/)

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## ONLINE SAQQARA

"A visitor to the site before 1975 would have viewed a landscape uncluttered by monuments of any kind ... An observant visitor might have noticed rough rectangular depressions in the sand: the outlines of buried tomb courtyards." Geoffrey Martin

Welcome to Saqqara.nl. This website is maintained by the Friends of Saqqara Foundation, a non-profit foundation aiming at providing financial support for Dutch archaeological research at Saqqara, Egypt. In particular the foundation supports the joint excavation team of the National Museum of Antiquities at Leiden and Leiden University. This team is advancing the research, documentation, and preservation of the monuments in the area south of the Step Pyramid of Djoser, where a cemetery of important New Kingdom officials is located.

The Leiden Excavations in the New Kingdom necropolis at Saqqara (Egypt) are a joint project of: RMO - Rijksmuseum van Oudheden (National Museum of Antiquities) at Leiden, the Netherlands UL - Leiden University, Faculty of Humanities, Department of Egyptology

**Please visit the site: <http://www.saqqara.nl/>**

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## **BRONZE AGE ERUPTION AND LM IB DESTRUCTION**

Dear All,

I would like to announce the completion of a paper I've been working on since last summer. First of all, I must convey my deep appreciation to the many scholars whose books, publications, discussions, and comments made this possible.

The title is “The Bronze Age Eruption of Santorini and Late Minoan IB Destruction Event” and is published at: [http://www.minoanatlantis.com/LM\\_IB\\_Destruction.php](http://www.minoanatlantis.com/LM_IB_Destruction.php)

This is not just a document in support of a theory. It is a statement of where we are and presents a case for the promotion of research using the most advanced techniques on the LM I/II stratigraphy. After reading it I hope you will agree that this is a fruitful course and help spread the word to others.

A free printable full-color PDF version of this publication is available to all on request at [minoanatlantis@gmail.com](mailto:minoanatlantis@gmail.com).

Kind Regards,

Sheppard Baird

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## **THE PAST IN HIGH-DEF, VOLUME 62** **NUMBER 3, MAY/JUNE 2009, BY ERIC A.** **POWELL**

The world's ancient heritage is coming to your desktop in 3-D

Lightning strikes the ancient Zapotec temple just minutes after the team has secured its equipment in a tunnel running deep within the building. After scrambling to get a very expensive laser scanner out of the late afternoon storm that is roiling above the Mexican site of Monte Albán, the mountaintop capital of the Zapotecs, archaeologist Elizabeth Lee and I are standing under a tree debating whether to go into the tunnel ourselves when the lightning bolt hits the back of the temple, not 40 feet away.

The flash of white and the deafening thunderclap scare us half to death, and I can't help but think that a more superstitious person might wonder if the Zapotec storm god Cocijo is registering his disapproval at what Lee and her small team are doing. Their project, a high-definition 3-D laser scan of a building archaeologists have dubbed "System IV," is designed to produce a detailed record of the temple that will endure. Should the building fall victim to an earthquake or suffer some other kind of damage, the data produced by the scan will ensure it is "digitally preserved" in perpetuity, and the information could perhaps even aid in its reconstruction. Surely Cocijo, the paramount god of a people who were among the first literate cultures in Mesoamerica, would approve of a record that lasts forever.

Lee is a program manager for CyArk, a California-based nonprofit that encourages laser scanning of important heritage sites all over the world. After two days of scanning System IV, she and Frank Collazo of Leica Geosystems, which manufactures laser scanners, have collected nearly half a billion data points on the temple (415,026,837 to be precise). Each measurement represents a single point on the structure's surface whose coordinates are known relative to all the others to within a millimeter. Together they make up what those in the scanning business call a "point cloud." A raw 3-D data set that can be used to create a digital blueprint of the building, the point cloud of System IV is a far more accurate record of the building than anything that could be produced by hand measurements. To boot, it's infinitely faster to register points on the temple with a laser than with traditional surveying methods, saving weeks or even months of precious field time.

Overlooking all three branches of southern Mexico's Valley of Oaxaca, Monte Albán was a major center of the Zapotec state from about 500 B.C. to A.D. 750 and was first studied in earnest in 1931. Excavations show System IV was built on the site's main, eight-acre plaza around A.D. 450 atop the remains of older structures. The structure might have served the ancient Zapotecs as a kind of amphitheater from which to watch rites being carried out at Monte Albán's main pyramid.

Archaeologists will be able to use the point cloud to analyze System IV's facades, which are similar to those found at the ancient city of Teotihuacán in the Valley of Mexico to the north. Conservators can use the high-resolution images to monitor cracks in the

temple walls, no small concern in an area that experiences earthquakes on a regular basis. While the data will be the property of the Mexican national park system and ultimately under the control of archaeologist Nelly Robles, Monte Albán's director, they will be publicly accessible through CyArk's website ([www.CyArk.org](http://www.CyArk.org)). Beginning this spring, anyone with an Internet connection will be able to view System IV's point cloud, along with those of Maya pyramids at Chichén Itzá and Tikal, and buildings at a host of other ancient sites that are already online.

To our relief, the rain stops almost as suddenly as it began, and the storm drifts off across the southern branch of the valley. Now recovered from the close call with the lightning bolt, Lee and I help Collazo load up a small truck with the scanning equipment. Then we start on the bumpy drive down the mountain to Oaxaca City to meet with the man who, Collazo says, "invented the point cloud."

Ben Kacyra, the founder of CyArk, was born in 1940 in the northern Iraqi city of Mosul. As a child, Kacyra and his family made trips to the Assyrian ruins of Nineveh, which he credits with instilling in him a deep and abiding passion for the past. After immigrating to the United States in 1964, Kacyra studied civil engineering at the University of Illinois and then founded his own firm in the Bay Area.

A restless entrepreneur, Kacyra sold the business in 1989 and founded Cyra Technologies, a company devoted to creating more efficient means of surveying. In his long experience at construction sites, Kacyra had been frustrated by the imprecise methods used to record structures after they had been built, a critical task, since buildings can vary significantly from their original blueprints.

Kacyra and his team settled on lasers as the most precise tool, and licensed a type invented at MIT for the "Star Wars" missile defense system. They then developed the means to measure the almost infinitesimal amount of time it takes a laser to travel from a scanner to a surface and back. This technology, known as "time of flight" scanning, led to the invention of a portable device that could create point clouds yielding the highly accurate digital blueprints Kacyra was after. Since the 1990s, laser scanners based on time of flight technology, as well as other methods, have been employed to create 3-D models of everything from aircraft to artificial limbs. One significant application of laser scanning is monitoring structural integrity. At nuclear power plants or offshore oil platforms, periodic scans can be used to monitor subtle shifts in significant equipment, anticipating potential failures before they happen.

The application of 3-D laser scanning to archaeology is still being explored, which is where CyArk comes in. Once Kacyra sold his scanning patents to Leica in 2000, he moved on to the next phase of his life, nurturing the Kacyra Family Foundation, headquartered in Orinda, California, and dedicated to funding medical and energy research. But the destruction of the colossal stone Buddha statues in Afghanistan's Bamiyan Valley by the Taliban in 2001 led him back to scanning.

"I thought, what if there had been a 3-D laser scan of the Buddhas?" says Kacyra. "A record like that would have meant so much. Nothing can replace the actual monuments, but a 3-D scan of them would have meant they would not have been so completely lost. I began to realize that cultural heritage sites are constantly at risk from not just war, but the elements and natural disasters." Convinced that 3-D scans had

the potential to help the world's threatened archaeological and heritage sites, Kacyra founded CyArk in 2002.

"I wanted to help promote the idea of digital preservation," he says.

"It not only helps heritage professionals monitor at-risk sites, but helps promote education about their value." From the beginning, a cornerstone of CyArk's philosophy has been that 3-D scans should be available to everyone via the Web.

Since its founding, CyArk has teamed up with a number of partners, from universities and museums to companies like Leica Geosystems and Google, to scan some 30 sites, including sections of Pompeii, the medieval areas of the city of Merv in Turkmenistan, and cliff dwellings at Mesa Verde National Park in Colorado, among others.

Larry Weise, the park director at Mesa Verde, connected CyArk and Robles, and helped set up the pilot scanning project at Monte Albán's System IV. "Scanning, and the work that CyArk does, gives us a pretty important tool," says Weise, whom I meet in Oaxaca City. "You can spend one month drafting a site by hand, and in two hours you can get an even more accurate result by laser scanning. It speeds things up."

Weise is on hand to participate in a "scanning summit," a workshop organized by Kacyra at a hotel in Oaxaca City around the occasion of the project at Monte Albán. In addition to Weise, participants include classicist Bernard Frischer of the University of Virginia, who has spearheaded the creation of a digital model of ancient Rome (see "Digital Archaeology 2.0," January/February), and Pete Kelsey, a manager at Autodesk, the company that makes the popular AutoCAD drafting software.

While Collazo, Lee, and I are at Monte Albán, Kacyra convenes the group to discuss ways to broaden scanning's impact. The primary topic of conversation is what Kacyra calls "The 500," an ambitious plan to scan 500 sites in the next five years. The program is meant not only to collect data on endangered ancient sites, but also to stimulate the development of local scanning technology centers around the world.

When we reach the hotel, we find Kacyra deep in discussions about the effort but eager to know how the scanning went. Collazo is due to present CyArk's data to Robles and her team from Monte Albán the next morning, so after a quick conversation, he retires to his room to crunch numbers. After a few hours of work, he has processed the point cloud and can manipulate it in a number of ways. With just a few clicks of the mouse, Collazo can resolve the points into a highly detailed, ghostly image of System IV.

Robles and her team crowd into the hotel's conference room the next day for a look at the scans, which Collazo projects on the wall. In a few minutes, he uses the point cloud to generate architectural renderings of the temple, then he slices the structure up into discrete sections that can be measured and examined in minute detail.

The archaeologists are particularly impressed when he zooms in on cracks in the façade.

The flexibility of the information is especially exciting to those in the room who have spent hours under the Oaxacan sun measuring every square centimeter of a Zapotec stone structure--probably mostly everyone here, actually. "You can use this for predictive modeling,"

Collazo explains to the group. "You can determine what components of the structure are potentially at risk for collapse. You can use it for hydrological analysis, to see where water goes in the structure." The list of applications goes on and on, as dozens of different views of System IV flash across the wall. It's almost as if the temple is haunting the room.

CyArk is not the only organization promoting laser scanning at heritage sites. Teams around the world are busy scanning at monuments as varied as the ruins of Petra and the moai of Easter Island, where two teams are collecting data on the island's famous stone statues.

Autodesk's Pete Kelsey, who also has a background in geology, was on vacation when he got his first taste of digital preservation two years ago. After visiting clients in South America, he decided to take a few days for himself and go to Rapa Nui, or Easter Island. "I had my surveying equipment and mapping software," says Kelsey. "But I was just a tourist. So I decided to ask around and see if anybody on the island would be interested in the tools I had." He soon learned that Rapa Nui archaeologist Sonia Haoa was in the middle of a multiyear mapping project aimed at making a complete survey of the island.

After spending three days with Haoa's team, Kelsey knew that laser scanning would be a great help to the effort. Later that year, he assembled a team drawn from American-based surveying companies.

Outfitted with two laser scanners, one long range and one short range, they joined Haoa in the field for four days. They managed to scan seven archaeological sites, including the Rano Raraku quarry where the island's famous moai were sculpted. The high-resolution data from the scans were then incorporated into Haoa's master map.

"Those monuments are so important to the people of Easter Island," says Kelsey. "The lifeblood of the island is tourism, so any tools that help them monitor the moai and the sites are pretty important."

The Easter Island data, including high-resolution scans of many of the moai, will soon be publicly accessible through CyArk's website.

Another scanning effort underway on Easter Island is being led by UCLA archaeologist Jo Ann Van Tilburg. Her team plans to use close-range laser scanning to document all of the moai on the island prior to conservation work (this project is supported by the Archaeological Institute of America, which publishes *Archaeology*). Close-range scanners work on a different level of detail than the long-range ones used to record sites, and are accurate to within 50 microns, narrower than a human hair. As a test, Van Tilburg's team has scanned a moai in the British Museum's collection. Known as Hoa Hakananai'a ("hidden friend" in Rapa Nui), the moai is probably the most significant one outside of Rapa Nui, and is especially notable for intricate petroglyphs that were incised in its back. "We wanted especially to see what kind of detail we could get on those carvings," says Tilburg, who is studying the scans to determine whether certain glyphs were made with stone adzes or metal tools. "We are still experimenting with the technology, but we think it might be possible to use scanning to measure the rate at which the moai are eroding, which will be an immense contribution to their preservation."

Laser scanning is hands down the best technology for documenting stone sculpture, according to Lori Collins, an archaeologist at the University of South Florida. She and her colleague Travis Doering run an office at the university that, inspired by CyArk, encourages use of laser scanning across academic departments in diverse fields such as engineering, urban planning, and environmental studies. They also are in charge of an effort to collect high-resolution scans of ancient stonework in Latin America. For the past six years, Doering and Collins have traveled to sites such as the Olmec center of La Venta in Tabasco, Mexico, and the Preclassic Maya city of Kaminaljuyu in Guatemala to use close-range scanners to document steles and other stone monuments. The project has so far created scans of more than 200 stone sculptures ([research.famsi.org/3D\\_imaging](http://research.famsi.org/3D_imaging)). The scan of one monument in particular, Stele 65 at Kaminaljuyu, has revealed previously unknown carvings that had been obscured by later glyphs.

"Another benefit to this type of noncontact, nondestructive documentation is the ability to use the data to create exact replicas," says Doering. Detailed re-creations based on scans can replace monuments that are at risk of being looted or damaged. He and Collins are now working with authorities at La Venta to make exact replicas of Olmec stone monuments that were vandalized late last year.

Collins and Doering have also had experience in long-range scanning of archaeological sites. They are currently engaged in a laser survey of Florida's historical sugar mills, but they are probably best known in the state for their scan of the famous Miami Circle. Consisting of a series of holes forming a perfect circle in the limestone bedrock of downtown Miami, the site is thought by some archaeologists to be the foundation of a prehistoric ritual structure. A laser scan of the site before it was covered as a protective measure yielded a highly detailed map that revealed distortions in previous measurements of the site. That data became even more important when a second, similar circle was discovered only 800 feet away. Known as the Royal Palm Circle, the site was uncovered during development that was halted only briefly. Collins and Doering were able to conduct a quick scan that confirmed it was almost identical to the Miami Circle in size and layout. A conventional map on the same level of detail as the scan could not have been made under the time constraints within which the archaeologists were working.

With the pilot study at Monte Albán finished, Kacyra asks Robles if there's anything else she'd like scanned, since Collazo and Lee have a couple of days to spare. There are thousands of sites in the Valley of Oaxaca, and hundreds in the vicinity of Monte Albán, but there is only one that Robles wants the team to scan.

A rock climber recently discovered a set of Zapotec hieroglyphs carved on a cliff face not far from the city (certain details of the site have been changed to protect its location). The catch is that the glyphs are under a narrow overhang high in the cliff. Not even her smallest student can fit into the space, and only a few glyphs can be read accurately from outside the overhang. Robles wonders if Collazo and Lee can use the scanner to record the hieroglyphs. It's an unorthodox request, a far cry from scanning a large ritual structure.

Over a dinner of chicken mole on the town square, I listen in as Lee and Collazo discuss the challenge with Robles's protégés, who include archaeologists Ricardo Higelin and Lucia Cázares. The site is difficult to reach, and will involve hauling the scanner up the

cliff by rope, but the prospect seems to invigorate the group. Lee and Collazo discuss how they'll position the scanner, since a tripod will not fit on the narrow ledge just outside the shelf. They decide to build a small platform on the cliff face out of wooden planks, a decidedly low-tech solution.

The next morning, the team drives to the site and wraps the scanner securely in foam and cardboard. After Lee and Collazo scramble up to the shelf, they haul the scanner up more than 200 feet. The machine is sturdy enough but still takes a couple of heart-sinking hard knocks against the cliff.

Collazo then builds a wooden platform for the station. You won't see this technique illustrated in any manual, but somehow he is able to make it work. He takes a series of improbable scans and can tell he has captured the symbols, though whether they will be of high enough resolution to be deciphered will be something for the Mexican archaeologists to figure out once the data have been crunched.

After the scanner comes back down the cliff in one piece, everyone breathes a sigh of relief. "I love the unexpected applications of scanning," says Lee. "Capturing hieroglyphs was the last thing I expected to do when I came down here, but that's how it goes. Who knows what we'll be doing with this technology in 10 years?"

Eric A. Powell is deputy editor at ARCHAEOLOGY. Visit [www.cyark.org](http://www.cyark.org) for more on the Monte Albán scanning project.

**Please visit the site: [http://www.archaeology.org/0905/etc/high\\_def.html](http://www.archaeology.org/0905/etc/high_def.html) [Go there for nice pix]**

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## **ORIENTAL INSTITUTE DEMOTIC OSTRACA ONLINE**

The Oriental Institute Museum houses a large collection of nearly 900 Demotic ostraca, pottery sherds upon which ancient scribes recorded a wide variety of text types. The vast majority of the corpus concerns economic matters and consists of receipts, contracts, memos, and lists, but there is a small selection of other genres such as votive and astrological texts. With few exceptions, the material derives from the environs of Thebes and over half of the collection derives from the Oriental Institute excavations at Medinet Habu. Attested dates in the documents range from the early Ptolemaic Period (circa 285 B.C.E.) to the early Roman Period (circa 80 C.E.). Less than one third of the corpus has been published:

\* 160 ostraca in Miriam Lichtheim, *Demotic Ostraca from Medinet Habu*, Oriental Institute Publications 80 (Chicago: University of Chicago Press, 1957)

\* 61 ostraca in Brian P. Muhs, *Tax Receipts, Taxpayers, and Taxes in Early Ptolemaic Thebes*, Oriental Institute Publications 126 (Chicago: The Oriental Institute of the University of Chicago, 2005), available online [here](#)

\* Several dozen ostraca have been published in the articles of Ursula Kaplony-Heckel and Otto Neugebauer.

The O.I.D.O.O database was developed as both a scholarly research tool and a means for the publication of the unpublished Oriental Institute Demotic ostraca. It is our aim to make available all of the Demotic ostraca in this collection, both published and unpublished, to scholars worldwide in a format that will allow for complex searching and sorting criteria as well as quick and easy updating. This will be accomplished through periodic updates as additional texts are edited and entered into the database.

Please visit the site: <http://oi.uchicago.edu/research/projects/oidoo/> is the Oriental Institute Demotic Ostraca Online [Go there for links]

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## **VIDEO - JOIN ZAHY HAWASS INSIDE THE MYSTERIOUS TUNNEL IN THE TOMB OF SETI I**

For the last two years, Zahi Hawass has led an all-Egyptian team that is excavating and restoring the mysterious tunnel leading from the burial chamber of King Seti I deep into the Theban cliffs. No explorer has ever reached its end. The reason for the tunnel's existence is unknown, but Hawass is determined to uncover its mysteries.

As the excavation proceeds, engineers are shoring up the fragile walls and ceiling of the tunnel and adding a wooden stairway that allows the team to move about more easily inside. This work is challenging and dangerous, but it is essential to the preservation of the tomb of Seti I, KV17, widely considered one of the most beautiful in the Valley of the Kings.

Please visit the site: <http://www.drhawass.com/blog/video-join-zahi-hawass-inside-mysterious-tunnel-tomb-seti-i>

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## **ANCIENT MEASURES CONVERTER** **DIOPHANT (FREWARE)**

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Demetris I. Loizos

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## **FREE ONLINE ARCHAEOLOGICAL BOOKS**

Dear friends,

many of you probably already know this website, but for those who don't: Have a look at the University of Heidelberg's nice collection of digitized books (e.g. Evans' Palace of Minos, under "Minoische und Mykenische Kultur") at:

<http://www.ub.uni-heidelberg.de/helios/fachinfo/www/arch/digilit/digilit.html>

With my best wishes from Crete

Sabine Beckmann

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## **SPECIAL REPORT: EGYPT, DEBBY** **KNOX**

CAIRO, Egypt - Just south of Cairo, in an area known as Saqqara, there is something that has just been uncovered and a 24-Hour News 8 camera was the first to capture the images of what lies deep inside the Step Pyramid.

Dating back 5,000 years, the oldest pyramid in Egypt is now frail and breaking down. Builders are laying in the concrete and putting in massive stones to restore the disintegrating pyramid. No heavy equipment is being used.

The workers shape every new stone, use dollies, wheelbarrows and human strength -- not too different from centuries ago. They've been at it for a year under the direction of Dr. Zahi Hawass. While his job is Egypt's Secretary General of Antiquities, Hawass now feels like a doctor with a patient on life support.

The pyramid's unique design is a result of a change in plan. What started as a flat roof, two-level tribute to the Pharaoh Djoser, became the largest structure in existence after its estimated 20-year construction.

It reaches more than 200 feet high, but the burial chamber lies 100 feet below the sand and rock and that's just where a 24-Hour News 8 crew went.

**Please visit the site:**

**[http://www.wishtv.com/dpp/mobile/Special\\_Report\\_Egypt\\_Adventure\\_20090518](http://www.wishtv.com/dpp/mobile/Special_Report_Egypt_Adventure_20090518)**

**[Go there for video of the pyramid's insides]**

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## AEGEAN AND BALKAN PREHISTORY

Dear colleagues,

Let me announce new contributions on our [www.aegeobalkanprehistory.net](http://www.aegeobalkanprehistory.net) website, which attempts to bring together experts working in the Balkans and the Aegean and specializes not only in Grey and Matt-painted wares but publishes also excavation reports and new research.

\*Iro Mathioudaki\* writes about the typology and chronology of the Mainland Polychrome Pottery, a ware familiar to most of us, which at the same time still lacks a systematic analysis. [http://www.aegeobalkanprehistory.net/article.php?id\\_art=16](http://www.aegeobalkanprehistory.net/article.php?id_art=16)

\*Stefan Alexandrov\* presents new 2nd Mill funerary finds from the western Bulgaria. I would like to draw your attention to the highly unusual wheel-made matt-painted vessel found along rich golden ornaments. It is clearly imported in Thrace but its date and provenance remain unclear. [http://www.aegeobalkanprehistory.net/article.php?id\\_art=15](http://www.aegeobalkanprehistory.net/article.php?id_art=15)

New illustrations were also added to the report by \*Martin Hristov\* on the rich golden offerings at central Bulgarian site of Dubene, mentioned previously on the Aegeanet. An updated report and more details on the finds will follow.  
[http://www.aegeobalkanprehistory.net/article.php?id\\_art=3](http://www.aegeobalkanprehistory.net/article.php?id_art=3)

The site is intended as an on-line volume, which will in the long run cover certain topics, but should also serve as a platform of communication between the Balkan and the Aegean.

\*We are open for further submissions!\*

Best greetings

Barbara Horejs and Peter Pavúk

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[www.aegeobalkanprehistory.net](http://www.aegeobalkanprehistory.net)

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## **ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS**

# **ANCIENT GREEK COLONIES IN THE BLACK SEA**

Bryn Mawr Classical Review 2009.04.79

Dimitrios V. Grammenos, Elias K. Petropoulos (ed.), *Ancient Greek Colonies in the Black Sea 2* (2 vols.). BAR International Series; 1675 (1-2). Oxford: Archaeopress, 2001. Pp. viii, 1262. ISBN 9781407301105. 140.00 (pb).

Reviewed by Valeriya Kozlovskaya, NYU ([lera123@verizon.net](mailto:lera123@verizon.net)) Word count: 3724 words

This two-volume publication is the second--and final--part of *Ancient Greek Colonies in the Black Sea*, edited by D.V. Grammenos and E.K.

Petropoulos.<sup>1</sup> Both parts are collections of articles mostly presenting archaeological sites from classical antiquity located on the shores of the Black Sea. This work is unique in terms of its scale: there are twenty six articles in part one, published in 2003, and thirty four in part two. Many of the articles that discuss individual sites are written by the archaeologists who are in charge of the excavations at these sites. However, while the chronological and geographical scope of both parts is the same, the part under review embraces a wider range of topics (authors and titles of the chapters are listed at the end of the review). This second installment truly completes the project in that it provides coverage of the sites that were missing in part one and introduces some themes that were absent from the discussion. Many of the articles are quite long, and all of them are accompanied by extensive bibliographies. Moreover, almost every chapter contains either a short note about the author(s) or an entire CV, including authors' e-mail addresses, which some of the readers might find useful.

The structure of both parts of the publication is the same: the presentation of the sites in *Ancient Greek Colonies in the Black Sea 2* also starts with the territory of modern Bulgaria and then continues in a clockwise direction around the Black Sea. The first two articles feature the sites of ancient Dionysopolis (by M. Damyanov, pp. 1-36) and Bizone (by A.E. Salkin, pp. 37-50), both located in the modern region of Dobrudzha. Each article provides a general introduction to the region and describes various aspects of its development, and then features the respective sites. The chapter on Dionysopolis, in particular, is very detailed: after an overview of the local geography and a discussion of the relevant written sources, it focuses on archaeological evidence (including epigraphical and numismatic finds) from the site and on some controversial issues associated with it. It also offers a summary of the previous scholarship on ancient Dionysopolis. The publication of this article is well timed in view of a recent discovery at the site: in 2007, construction work in modern Balchik revealed remains of a Greek temple, which was interpreted as a temple of Cybele, or Pontic Mother. The site is currently being excavated by a team from the Varna Archaeological Museum, and some preliminary reports have been published.<sup>2</sup>

The cult of Cybele, in general, is a prominent topic in this section of *Ancient Greek Colonies in the Black Sea 2*. First, H. Todorova (pp. 175-238) presents a detailed account of the archaeological work at the Durankulak Lake--the territory that in antiquity was particularly associated with the goddess Cybele. In addition, a part of the chapter by Z. Gotcheva on the mythology and religion of the West-Pontic Greek colonies (pp. 51-84, in French) is devoted to the Great Mother Goddess in her various manifestations--Cybele, Demeter, etc. (pp. 72-6). The author also discusses other major deities (Apollo, Dionysus, the Great God) and cults (including Roman imperial cults), as well as two mythological stories relevant to the history of the region: the first story is that of Phineus, the blind prophet rescued by the Argonauts from the Harpies; the second concerns the city of Dionysopolis and the origins of its name. The latter part of the article, inevitably, also deals with the controversial question of the foundation of Dionysopolis, already addressed in the chapter by Damyanov.

The remaining two articles in this section are thematic, and each of them focuses on a number of sites rather than on an individual site.

The chapter by I. Karayotov discusses monetary systems of Mesambria, Apollonia Pontica, Odessos, and Dionysopolis (pp. 127-238). The numismatic evidence presented by the author is organized by the type of coin, the date, and the place where it was issued. K. Panayotova offers an overview of funerary rites and types of burials attested in the necropoleis of the Greek settlements in the Western Black Sea region (pp. 85-126). The article is very informative, but a slight inconvenience is caused by the fact that the necropoleis discussed in the text are sometimes associated with settlement sites not featured in the publication: reports on some of them can be found in part one (Apollonia Pontica, Mesambria, and Odessos), but others are absent altogether.

The next section of the book also contains a piece on necropoleis: it takes us farther north along the western Black Sea coast to sites located in the territory of modern Romania. In the first part of her article, V. Lungu discusses the necropoleis of Histria, Orgame, Tomis, and Callatis (pp. 337-82, in French). She briefly introduces each site and presents archaeological evidence from the necropoleis, followed by conclusions on the demography and social composition of the populations of the respective settlements. In the second part of the chapter, the author summarizes her conclusions and defines the types of burial practices characteristic of the region as a whole. Detailed accounts on two of these settlement sites--Callatis (by A. Avram, pp. 239-86) and Tomis (by L. Buzoianu and M. Barbulescu, pp. 287-336)--can be found in the same volume, whereas Histria and Orgame featured in the 2003 publication. In general, the reports on individual sites throughout *Ancient Greek Colonies in the Black Sea 2* often follow similar patterns, with some variations. Thus, the chapter on Callatis starts with a presentation of the site (including the history of the scholarship), and then proceeds to a discussion of the foundation of the colony, its coinage, institutions, cults, epigraphical documents, and rural territory. The same topics are covered in the article on Tomis, although here the authors chose a chronological approach, discussing the development of the city stage by stage.

The prosopographical study by V. Cojocaru (pp. 383-434, in French) serves as a transitional piece between this section and the rest of the volume, since the author employs evidence not only from West Pontic colonies, but also from sites in the Northwestern and Northern Black Sea regions. He discusses the question of ethnicity,



based on his analysis of Greek and non-Greek names, as well as toponyms and ethnonyms, attested in epigraphical and literary sources. It is particularly interesting to consider his conclusions in connection with the material from various necropoleis published in the same volume.

The last section of volume one is devoted to the northwestern Black Sea coast: it contains seven articles on various sites located in the territory of modern Ukraine, some of which are virtually unknown to a western readership. The latter include, first of all, the sites in the Odessa region, discussed by Y.F. Redina (pp. 507-36), and those in the Lower Dnieper area, presented by N.A. Gavriilyuk and V.V. Krapivina (pp. 563-90). Many of these sites were only sporadically excavated and the results of the excavations have not always been published, not even in Ukrainian or Russian. Now the situation is changing for the better, partly because of the renewed interest in these sites (as in the case of the Odessa region, where archaeological work has been resumed at some places), and partly because of a noticeable shift in the general direction of local archaeological research, since more and more scholars seem to embrace a synoptic approach to the study of the region. This implies, inevitably, incorporation of non-Greek sites and closer collaboration between scholars of Classical antiquity and Scythologists, a fine example of which is the article by Krapivina and Gavriilyuk. The interest in interrelations between Greek and non-Greek populations in the area is further evident in another chapter by Gavriilyuk in the same section of the volume, where the author considers Greek imports in Scythia (pp. 627-76). So, despite its title, *Ancient Greek Colonies in the Black Sea 2* also includes discussions of non-Greek populations and sites, and is thus a step forward in comparison to the first part of the publication, since it provides a more complete picture of the various Pontic regions.

The remaining four articles in this section focus on the four main sites on the northwestern Black Sea coast: Tyras (by T.L. Samoylova, pp. 435-70), Nikonion (by N.M. Sekerskaya, pp. 471-506), Olbia (by V.V. Krapivina, pp. 591-626), and the Island of Leuke (by S.B.

Okhotnikov and A.S. Ostroverkhov, pp. 537-62). The chapters on Tyras and Nikonion follow, to a great extent, the standard pattern known from the other articles on individual sites in this volume. The authors start with the relevant ancient sources and the history of the scholarship, and then proceed to questions associated with the foundation of the city, followed by a presentation of the archaeological finds by category, and a discussion of the development of the city, stage by stage. The structure of the chapter on the Island of Leuke, however, is somewhat different, and this has to do with the nature of the site: there was no ancient settlement on Leuke, but it was home to a sanctuary of Achilles. Therefore, a large portion of the article is devoted to a discussion of the cult of Achilles and the relevant material evidence from the site. The part of the article that deals with the geology of the island is also very useful, especially in view of a recent dispute between Romania and Ukraine about the extent of their respective territorial waters, taken to the International Court of Justice in the Hague: Romania based its demands on the claim that the Island of Leuke is, in fact, not an island at all.

The chapter on Olbia in the 3rd and 4th centuries AD, although very detailed and informative, would have been more in place in the first part of the publication, which also contains other accounts on Olbia and its chora.<sup>3</sup> The same can be said about the first two pieces of the second volume of *Ancient Greek Colonies in the Black Sea 2*: the first

article is about the chora of Chersonesus in the Western Crimea and the settlement of Kalos Limen in the Northwestern Crimea (by S.B.

Lantsov and V.B. Uzhentzev, pp. 677-728), while the second discusses Roman Chersonesus (by V.M. Zubar, pp. 729-88). They both rather belong to the 2003 publication, which featured the site of Chersonesus.

The rest of the first section of volume two clearly includes articles on sites and topics that were--for whatever reason--left out of the corresponding section in the 2003 publication. Geographically, it covers the Northern Black Sea region (modern Ukraine and Russia); thematically, it includes lesser-known sites, as is evident from the title of one of the chapters--Small and poorly studied towns of the ancient Kimmerian Bosphoros (by A.A. Maslennikov, pp. 855-96)--an overview of several individual sites, some of which (such as Akra, for

example) are also the subject of separate articles in either the first or the second part of the publication. In particular, this section features the settlements of Tyritake (by V.N. Zinko, pp. 827-54), Iluraton (by V.A. Gorontcharovskiy, pp. 897-926), Akra (by A.V. Kulikov, pp. 1023-56), Kimmerikon (by V.K. Golenko, pp. 1057-82), and Torikos (by A.A. Malyshev, pp. 927-50), all of which lay in the territory of the ancient Bosporan Kingdom. In addition, this section contains articles on non-Greek settlement and burial sites, such as Scythian Neapolis (by Yu.P. Zaytsev, pp. 789-826) and the necropolis of Kul Oba (by N.F. Fedoseev, pp. 979-1022). The latter, in particular, focuses on the history of the discovery and the subsequent study of the famous barrow of Kul Oba and other tumuli in the area, and it also includes a detailed catalogue and illustrations of the most important finds from Kul Oba. Clearly, these are articles that expand the scope of the volume beyond the Greek colonies on the Black Sea coast. The chapter by A.A. Malyshev (pp. 951-78) also belongs to this category: it discusses, in a more general way, Greek presence in the North Caucasus and the interactions between the Greeks and non-Greeks in this region, from the Archaic period to Roman times.

This theme is also prominent in the next section of the volume, which contains two articles on sites located in the territory of modern Georgia. V. Licheli (pp. 1083-142) offers an extensive overview of Hellenistic and early Roman Colchis and Iberia, with a discussion of the major sites, archaeological finds, and relevant scholarship. He also includes a catalogue of all sites in the region that yielded any Greek (or Greek-looking) material (pp. 1118-28). A large portion of the chapter is devoted to the phenomenon of multilingualism in Colchis and Iberia during the Hellenistic period and, in particular, to the origins of Georgian writing (pp. 1104-17), which makes the article interesting not only to scholars of Classical antiquity, but also to linguists (although the author particularly emphasizes that his work "does not claim the linguistic analysis") (p. 1104).

A. Kakhidze presents (pp. 1143-78) the archaeological complex at Pichvnari that includes several individual sites dating to various periods and attributed to various cultures. The subject of the article is the Greek necropolis of the Classical period, which is, according to the author, the only Greek burial site in the Caucasus. The settlement associated with this necropolis remains unknown, but a contemporaneous Colchian settlement with a necropolis was also discovered at Pichvnari. The author provides a detailed description of the archaeological finds from the Greek burials and draws some general conclusions on the means, goals, and stages of Greek colonization, both in this region and outside of it. However, not everyone will agree with these conclusions and the way in which the author presents them. For example, the part where the author claims

that "contrary to the so-called emporial stage, trade was the result of the colonization, rather than determining its content" (p. 1159) would be more convincing if it contained some further explanation or at least references to other bibliographical sources. The latter also applies to the entire discussion of Athenian colonial practices (p. 1160), which culminates in the conclusion that the Greek settlement at Pichvnari must have been an Athenian colony.

The final section of *Ancient Greek Colonies in the Black Sea 2* consists of three relatively short articles. The first is a survey of ancient Greek settlements in Eastern Thrace (by S. Atasoy, pp.

1179-94) and has the format of a reference work. The author briefly describes the region and then introduces the settlements, site by site, starting with the Black Sea coast, followed by the Marmara Sea and the Aegean Sea coasts, and finishing with the inland settlements located along ancient routes and roads in Eastern Thrace (modern Turkey). Each entry is accompanied by a short bibliography, and there is a slightly longer general list of bibliographical references at the end of the article. The second chapter covers three sites also located in the territory of modern Turkey, but on the southern coast of the Black Sea--Cotyora, Cerasus, and Trapezus (D.B. Erciyas, pp.

1195-1206). All three were colonies of Sinope and, as is evident from the article, all three are better known from the small number of pertinent literary sources than from archaeological remains (which are also not abundant). This situation is caused by a combination of factors, such as the location and accessibility of the sites (both Cotyora and Cerasus have been identified with more than one site, and some of these sites are presently located in a military zone) or the long history of habitation (as in Trapezus, where ancient layers are covered by multiple later settlements). The article by S., Dönmez (pp.

1207-20) focuses on the same part of the coastal zone and the corresponding inland area, but discusses non-Greek population groups and their interactions with each other and the Greeks.

The final piece of this volume--and, in fact, of the publication--is J. Bouzek's survey of Greek fine pottery in the Black Sea region (pp.

1221-62). The author briefly goes over the sites and areas on the Black Sea coasts where Greek pottery was found, providing bibliographies for ceramic finds from each site, and then describes in detail the main types and classes of pottery attested at these sites, period by period. This chapter serves as an excellent conclusion to the publication, not in the least because the author's short introduction to the survey is so introspective: he has devoted a large part of his life to the study of the subject and is in a position to share his observations about the long-term development of the field.

As mentioned earlier in this review, *Ancient Greek Colonies in the Black Sea 2* provides an extensive bibliography on the subject, and this makes it an invaluable reference work. Unfortunately, these bibliographical references are not organized in the most effective way. Each article is accompanied not only by a list of references, but also by a list of abbreviations (and sometimes the latter and the former are compiled together). Some articles have bibliographical references incorporated into the footnotes; others have more than one bibliography--a short list after each part of the text (with references to the same publications appearing in more than one of these lists) and a longer one at the end of the chapter. Different authors seem to have followed different standards while compiling their bibliographies: some of the titles in Cyrillic are given in the original script,

transliteration, and translation; others, in the original script and transliteration; still others, only in translation or only in transliteration. Admittedly, the bibliographies are mostly accurate, even if somewhat unconventionally organized and not uniform.

The lists of abbreviations, on the other hand, seem to live a life of their own. Each individual list contains both standard abbreviations that are universally accepted (for periodicals, corpora, works of ancient authors, etc.) and abbreviations for major (and sometimes

minor) local publications, which are usually not known outside a particular region or country. The former repeat, list after list, without any alteration and could have been omitted altogether; the latter, however, vary, since individual authors have often used different abbreviations for the same publications, and this can be rather confusing. To give just a few examples: A stands both for the Ukrainian periodical *Arkheologia* (p. 1042) and for the Bulgarian periodical under the same title (pp. 26, 111), while the latter also is to be found in its unabbreviated form in some other lists of abbreviations (p. 82). AGSP is used interchangeably for two different books--*Antichnye gosudarstva Severnogo Prichernomor'ia* (pp. 555, 705) and --*Antichnye goroda Severnogo Prichernomor'ia* (p. 111);<sup>4</sup> moreover, nothing indicates that these titles stand for books and not periodicals, and in one list of abbreviations the first title even appears paired up with the publication year of the second title (p.

763), which makes it virtually impossible to trace the item for a reader who has never heard of either volume. Such inconsistencies are too numerous to be mentioned here in full, and they make the task of finding the listed titles more difficult than it should be.

Despite these shortcomings, *Ancient Greek Colonies in the Black Sea 2* is a valuable source of information on many sites that are either not well known or not well published (or both). Presently, there is no other publication in English (and probably not in any other language) that covers almost every single site around the Black Sea to such an extent. Together with part one that was published in 2003, it is more than enough to start one's research on this region. So, do not wait any longer--after all, you have 1262 pages and 34 articles to tackle!

V.1. Dionysopolis, its territory and neighbours in the pre-Roman times / Margarit Damyanov -- Bizone / Asen Emilov Salkin -- La Thrace Pontique et la mythologie grecque / Zlatozara Gotcheva -- Burial and post-burial rites in the necropoleis of the Greek colonies on the Bulgarian Black Sea Littoral / Krystina Panayotova -- Le monnayage de Messambria et les Monnayages d'Apollonia, Odessos et Dionysopolis / Ivan Karayotov -Durankulak - a Territorium Sacrum of the Goddess Cybele / Henrieta Todorova -- Kallatis / Alexandru Avram -- Tomis / Livia Buzoianu and Maria Barbulescu -- Necropoles grecques du Pont

Gauche: Istros, Orgamé, Tomis, Callatis / Vasilica Lungu -- "L'histoire par les noms" dans les villes grecques de Scythie et Scythie Mineure aux VIe-Ier siècles av. J.-C. / Victor Cojocaru --

Tyras: The Greek City on the River Tyras / Tatyana Lvovna Samoylova -- The Ancient City of Nikonion / Natalya Mikhaylovna Sekerskaya -- Greek Settlements on the Shores of the Bay of Odessa and Adjacent Estuaries / Yevgeniya Fyodorovna Redina -- Achilles on the Island of Leuke / Sergey Borisovitch Okhotnikov and Anatoliy Stepanovitch Ostroverkhov

-- Lower Dnieper Hillforts and the Influence of Greek Culture (2nd Century BC - 2nd Century AD) / Nadezhda Avksentyevna Gavrilyuk and Valentina Vladimirovna

Krapivina -- Olbia Pontica in the 3rd-4th Centuries AD / Valentina Vladimirovna Krapivina -- Greek Imports in Scythia / Nadezhda Avksentyevna Gavriluk

V.2. Distant Chora of Taurian Chersonesus and the City of Kalos Limen / Sergey Borisovitch Lantsov and Vladimir Borisovitch Uzhentzev -- Tauric Chersonesus and the Roman Empire / Vitaliy Mikhailovich Zubar -- The Scythian Neapolis and Greek Culture of the Northern Black Sea Region in the 2nd century BC / Yuriy Pavlovitch Zaytsev -- Tyritake / Viktor Nikolaevitch Zinko -- Small and poorly studied towns of the ancient Kimmerian Bosphoros / Alexander Alexandrovitch Maslennikov --

Iluraton: a Fortress of the 1st - 3rd centuries AD on the European Kimmerian Bosphoros / Vladimir Anatolyevitch Gorontcharovskiy -- Torikos and the South-Eastern Periphery of the Bosphoran Kingdom (7th C. BC - 3rd C. AD) / Alexey Alexandrovitch Malyshev -- Greeks in the North Caucasus / Alexey Alexandrovitch Malyshev -- The Necropolis of Kul Oba / Nikolay Fyodorovitch Fedoseev -- Akra and its chora / Alexey Vladislavovitch Kulikov -- Kimmerikon / Vladimir Konstantinovitch Golenko -- Hellenism and Ancient Georgia / Vakhtang Licheli -- Greek Necropolis of Classical Period at Pichvnari / Amiran Kakhidze -- Ancient Greek Settlements in Eastern Thrace / Sümer Atasoy -- Cotyora, Kerasus and Trapezus: The Three Colonies of Sinope / Deniz Burcu Erciyas -- The Central Black Sea region, Turkey, during the Iron Age:

the Local Cultures and the Eurasian Horse-Riding Nomads / S,evket Dönmez -- Greek Fine Pottery in the Black Sea Region / Jan Bouzek

Notes:

1. Part one, also in two volumes, was published with a different press: D.V. Grammenos, E.K. Petropoulos, *Ancient Greek Colonies in the Black Sea* (2 vols.). Publications of the Archaeological Institute of Northern Greece, no. 4. Thessaloniki: Greek Ministry of Culture, 2003.

For a review of this publication, see B. Bäbler, *BMCR* 2004.09.01.

2. I. Lazarenko, E. Mircheva, R. Encheva, and N. Sharankov, "Arkheologicheski razkopki v gr. Balchik, ul. 'Chaika' i ul. 'Gen. Zaimov' (obekt 'Khram na Pontiiskata Maika na bogovete')," in *Arkheologicheski otkritiia i razkopki prez 2007 g.* (Sofia 2008), 297-300; *Minerva. The International Review of Ancient Art and Archaeology*. July/August 2008 (vol. 19.4)

3. For more information on Olbia in English (including the 3rd and 4th centuries AD), see David Braund and S.D. Kryzhitskiy, *Classical Olbia and the Scythian World* (Oxford 2007)--an important collection, which appeared too late to be included in Krapivina's bibliography in *Ancient Greek Colonies in the Black Sea 2*. For a review of this publication, see V. Kozlovskaya, *JRA* 22 (2009) (forthcoming).

4. G.A. Koshelenko, I.T. Kruglikova, and V.S. Dolgorukov (eds.), *Antichnye gosudarstva Severnogo Prichernomor'ia* (Moscow 1984); V.F. Gaidukevich and M.I. Maksimova (eds.), *Antichnye goroda Severnogo Prichernomor'ia* (Moscow-Leningrad 1955).

Please visit the site: <http://bmc.brynmawr.edu/2009/2009-04-79.html>

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# **THE GORDION WOODEN OBJECTS, VOLUME I, THE FURNITURE FROM TUMULUS MM, ELIZABETH SIMPSON**

Publication year: 2009

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Number of volumes: 2

List price: EURO 250.00 / US\$ 373.00

Volume I of The Gordion Wooden Objects is a study of the furniture from the largest tomb at Gordion (Tumulus MM), Turkey, excavated in 1957 by the University of Pennsylvania Museum. The tomb dates to the eighth century BC and is thought to be the burial of the great Phrygian king Midas or his father. The objects, initially misunderstood, are now identified as nine tables, two serving stands, two stools, a chair, and an open log coffin. Three pieces are ornately carved and inlaid with religious symbols and complex geometric motifs.

The wooden objects from Gordion are now recognized as the most important collection of well preserved wooden artifacts excavated from the Near East. Included in this volume are new photographs, reconstruction drawings, and eight scientific/technical appendices.

Contributors include: Harry Alden, Burhan Aytuğ, Mary W. Ballard, Robert A. Blanchette, Roland Cunningham, Laure Dussubieux, Patrick E. McGovern, Benjamin Held, Walter Hopwood, Joseph Koles, Lynn E. Roller, Krysia Spirydowicz.

Elizabeth Simpson, Ph.D. (1985) in Classical Archaeology, University of Pennsylvania, is professor of Ancient Art at the Bard Graduate Center, New York, N.Y. She is director of the Gordion Furniture Project and research associate at the University of Pennsylvania Museum, Philadelphia.

Please visit the site: <http://www.brill.nl/default.aspx?partid=18&pid=29022>

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## **CSA NEWSLETTER, VOLUME XXII, NO.** **1, APRIL, 2009**

Announcing that the April, 2009, issue -- Volume XXII, No. 1 -- of the \_CSA Newsletter\_ is now available at <http://csanet.org/newsletter/#spring09>

"Using AutoCAD® to Construct a 4D Block-by-Block Model of the Erechtheion on the Akropolis at Athens, III: An interactive virtual- reality database"

VRML models and data together. (Paul Blomerus and Alexandra Lesk)

<http://csanet.org/newsletter/spring09/nls0901.html>

"Yes, it is all about you: User Needs, Archaeology and Digital Data"

One size does not fit all. (Sarah Whitcher Kansa and Eric C. Kansa)

<http://csanet.org/newsletter/spring09/nls0902.html>

"You say potato and I say potahto . . . let's call the whole thing off' -- Some Thoughts on the Role of Standards and Specifications in Archaeology"

Standards need not be straight-jackets. (Fred Limp)

<http://csanet.org/newsletter/spring09/nls0903.html>

"Define the Audience and the Job to Build a Web Resource"

Web resources should not just be technology demonstrations. (Harrison Eiteljorg, II)

<http://csanet.org/newsletter/spring09/nls0904.html>

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**KNOSSOS POTTERY HANDBOOK:**  
**NEOLITHIC AND BRONZE AGE**  
**(MINOAN)**  
**NICOLETTA MOMIGLIANO (ED.)**

BSA Studies 14. London: The British School at Athens, 2007. Pp. xv, 276; figs. 148; tables 34; pl. 1; CD. ISBN 978-0-904887-55-6. \$170.00; £60.00.

Reviewed by Sean Hemingway, The Metropolitan Museum of Art, New York  
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Word count: 3794 words

Disclaimer: The reviewer has worked with several of the authors, most notably J.A. MacGillivray but also E. Hatzaki and P. Tomkins, at Palaikastro, another Minoan excavation on Crete sponsored by the British School at Athens.

The Knossos Pottery Handbook: Neolithic and Bronze Age (Minoan) can be seen as the prequel to the Knossos Pottery Handbook: Greek and Roman, which appeared in 2001.1 As its title implies, the book covers a vast time span from approximately 6500 to 1100 B.C. By any measure it is a significant achievement and the editor and authors are to be commended for collectively bringing together in one volume the most up-to-date presentation of the pottery produced at Knossos, the largest and single most important archaeological site on Crete in the prehistoric period. Some years ago an eminent British archaeologist gave a lecture in New York on the Indo-European question and during the discussion afterwards was asked how Crete fit into his theoretical models. He replied quite seriously that the problem with prehistoric Crete was that there was too much information available. At first blush, the reader of this book may have a similar impression. Taken as a whole, the quantities and variety of pottery that were produced at Knossos in the Neolithic and Bronze Age are staggering. However, the wealth of archaeological information that often renders the application of even sophisticated theoretical models inadequate is precisely what enables the kind of detailed ceramic analysis so carefully presented in this book. One must also keep in mind that this book is a reference work and is not meant to be read from cover to cover. It is aimed at the pottery specialist and field archaeologist. This reviewer would not recommend it for general or even undergraduate level reading. Its greatest strength lies in its rigorous application of stratigraphic sequencing to every period and its pottery, providing a clear and traceable thread of history through this important site, which has been the subject of study and excavation for more than a century. In this way, the reader can see how secure or in some cases how tenuously each ceramic phase is tied to that which precedes it and that which follows.

The book consists of an introduction by the editor, Nicoletta Momigliano, and six chapters written by specialists that are arranged chronologically. Momigliano stresses that this book is not a corpus of all prehistoric pottery that has been found at Knossos but instead focuses on local ceramic production. Momigliano provides a brief overview of the history of excavation and ceramic sequencing at the site beginning in 1878 under the



direction of Minos Kalokairinos and Sir Arthur Evans's historic and monumental research between 1900 and 1931, which culminated in his multi-volume work, *The Palace of Minos at Knossos*. Momigliano highlights the contributions of Evans's colleague, Duncan MacKenzie, who was the first to phase Neolithic and Minoan pottery each into three main stages, using the labels Lower, Middle and Upper Neolithic and Early, Middle and Late Minoan consistently, a scheme that Evans whole-heartedly endorsed.<sup>2</sup> Together Evans and MacKenzie further subdivided the Minoan phases into three sub-phases (Early Minoan I, II, III, etc.) for a total of nine phases for the Bronze Age. This tripartite Minoan classification system has remained in use for the Knossian ceramic sequence to the present day and Momigliano assesses some of its continuing problems at the site and especially when applied in the broader context of other sites on the island and in the Aegean. After Evans, Arne Furumark made important refinements to the later Knossian Bronze Age sequence in his monumental study of Mycenaean pottery and Mycenaean chronology first published in 1941. Numerous additional campaigns of excavations at Knossos in the second half of the twentieth century have sought to clarify the Knossian ceramic sequence. Most notable among these are Sinclair Hood's excavations along the Royal Road and in the palace in 1957-1961, which yielded a wealth of important new stratified material, and the excavations of the Minoan Unexplored Mansion by Popham and Sackett in the 1960's and 1970's.

It is important to note that the present volume is not merely a synthesis of what has already been published on Knossian pottery, as one might presuppose from its slightly misleading title of handbook, but is a new approach. The authors have formed a sequence of representative pottery groups founded on stratigraphic and stylistic observations that were initially determined without labels such as Early Minoan IIB or Middle Minoan IA. Each chapter adheres to a basic presentation that begins with a brief introduction to the period and the history of the scholarship. The main archaeological deposits for each pottery group are listed and their contexts discussed. The characteristics of the ceramic group are articulated through a description of the most common fabrics, wares and their decoration, and forms and their shapes; this constitutes the largest part of the text in each chapter. The body chapters conclude with sections on the relative chronology of the pottery group/ceramic phase and any synchronizations that it has with ceramic deposits at other Cretan sites as well as sites further afield in the Aegean and more generally the Eastern Mediterranean region. The synchronizations are also listed in useful tables that accompany each chapter.

There is not space in this review even to mention all of the different kinds of pottery from Knossos discussed within the book. Rather what follows are some measured comments on the different chapters. The first chapter, by Peter Tompkins, covers the entire ceramic producing Neolithic period (ca. 6500-3100 B.C.). The period is defined as nine strata which are divided into 9 pottery groups (Strata IX-VIII, VII-VIB, VIA-V, IV, IIIB, IIIA, IIB, IIA, and IC). Knossos occupies a central place in our understanding of the Cretan Neolithic as its earliest settlement precedes ceramic production, the Aceramic Neolithic, and the site shows continuous occupation to the very end of the Neolithic and into the Bronze Age. This chapter presents an excellent survey of this early period at Knossos and provides a sense of the rich Knossian ceramic sequence. In general the line drawings throughout the book are of a high quality. For a handbook, though, one expects to see as many complete shapes represented as possible. There are just nine whole shapes illustrated for the entire Neolithic and all appear as line drawings. It would have been nice to have had some photographs of whole vases as well. In Betancourt's book on the

history of Minoan pottery, for example, there are three complete or nearly complete pots from Middle Neolithic Knossos.<sup>3</sup> None of these is represented in Tompkins's drawings and one wonders how many other shapes, which are carefully described in the text, could have been illustrated. This chapter is the only one to include a microscopic analysis and presentation of the different fabrics used to make the pottery. Tompkins shows how the Knossos pottery sequence helps to secure later Neolithic Cretan chronology and identifies a range of imported pottery in the Knossos sequence, beginning with the very earliest pottery producing levels, that allows the Knossos sequence to be securely anchored to other Greek and Anatolian pottery sequences. Tompkins's chapter ends with a discussion of the issue of "Sub-Neolithic" pottery of the Early Minoan I period and concludes that there is no longer any reason to think that the Early Minoan I period begins any later than Early Cycladic I in the Cyclades, Early Helladic I in Greece, or Early Bronze I in the East Aegean. One gets the sense that, given the very fragmentary nature of the material, our understanding of this important early period will continue to evolve with on-going adjustments and re-analysis of the pottery and this chapter should be taken as the latest, not the last word, on this subject.

Chapter two, entitled Early Prepalatial (EM I-EM II), by David E.

Wilson, is divided into four pottery groups: The EM I Well Group, the West Court House Group, the North-East Magazines Group and the South Front Group. Sir Arthur Evans's excavations did not produce much stratified evidence for the Early Minoan period despite extensive tests that were undertaken between 1900 and 1908. It was only in later tests undertaken in the late 1950's and early 1960's by Sinclair Hood and Gerald Cadogan that well-stratified Early Minoan layers were identified. Subsequent soundings by J.D. Evans and then Peter Warren have enabled a refinement of the Early Minoan II period into EM IIA and EM IIB. Part of the problem for understanding this early period is the fact that much of the site is so heavily rebuilt in later periods that these early layers are less accessible or heavily disturbed. The most important deposit for understanding Early Minoan I ceramics at Knossos is a deep fill in a well located in the north-east wing of the later palace, which is one of twelve deposits excavated at the site that Wilson defines as diagnostic for this period. Wilson does not see a clear ceramic subdivision within the Early Minoan I period as has been previously argued. There is strong continuity in pottery fabrics and wares from Early Minoan I to Early Minoan IIA, represented by the West Court House Group (Early Minoan IIA early) and the Northeast Magazine Group (Early Minoan IIA late), when differences in forms and surface decoration allow for period subdivisions. The Wiped and/or Washed Ware is one characteristic ware of EM I that does not continue into EM IIA. Burnished wares, the Dark-on-Light Ware, which becomes so characteristic of Minoan pottery in later periods, and Red/Black Slipped Ware, including Light-on-Dark, comprise much of the fine pottery in addition to cooking and pithos wares. Perhaps not surprisingly, the fundamental cooking vessels -- tripod cooking pots and baking dishes -- begin in Prepalatial times and have a long history in Minoan ceramics. Wilson notes that there are no off-island ceramic imports at Knossos in the Early Minoan I period but Cycladic pottery does begin to appear in EM IIA contexts when imported pottery from East Crete and the Mesara also appears at Knossos. The EM IIB pottery phase, defined as the South Front House Group, by contrast, does not have many links across the island except for imported Vasiliki Ware, which, however, is not common outside of eastern Crete.

Chapter three on the Late Prepalatial period, or Early Minoan III-Middle Minoan IA, is written by Momigliano. Momigliano describes the EM III period at Knossos as a time of

retrenchment and isolation, continuing certain trends of the preceding EM IIB period and she sees the Middle Minoan IA period as a time of recovery, growth, and increasing contacts leading up to Protopalatial developments. Early Minoan III and Middle Minoan IA are often linked together in archaeological literature. The Early Minoan III ceramic phase has been controversial because it is not represented at many sites, which were destroyed and abandoned in EM IIB and not re-inhabited until MM IA or later. However, Knossos is a site that was continuously occupied and Momigliano is able to subdivide the period into EM III Early, the SFH Foundation Trench Group, and EM III Late, the Upper East Well Group, although as yet without detailed ceramic definitions of these sub-phases. The EM III pottery phase is represented by 10 deposits with a predominance of Light-on-Dark Ware. Knossian EM III pottery continues to be handmade with a few exceptions suggesting the first attempts at the use of the potter's wheel. Barbotine Ware and Polychrome ware make their first appearance but occur very rarely and NM suggests the latter may be imported to Knossos at this time. The Middle Minoan IA ceramic phase is called the House C/RRS Fill Group and only seven deposits are assigned to this group. There is much continuity in terms of fabrics, wares and forms from the EM III period and pottery generally continues to be handmade. Major innovations of this ceramic phase are the adoption of polychrome decoration and the appearance of new vessel forms such as straight-sided and carinated cups. As in the other chapters throughout the book less attention is given to the coarse wares and cooking wares. This is largely due to their secondary or non-treatment in earlier publications, and not because they do not exist and cannot add to our understanding of diagnostic pottery assemblages. Knossian imitations of Cycladic pottery appear in MM IA at Knossos and recent excavations at Akrotiri on Thera have yielded a few MM IA imports from Knossos. A Knossian imported vase at Lapithos is suggestive of the first clear Knossian contacts with Cyprus in the Middle Minoan IA period.

The fourth chapter on Protopalatial (MM IB-MM IIIA) pottery is by J.A. MacGillivray. This chapter is largely derived from MacGillivray's book on this subject, and follows the typology terminology that he establishes there.<sup>4</sup> The author only discusses fine ware, deviating from the schema established in the earlier, and later, chapters. JAM contends that in this period Knossos received exchanges, offerings and tributes from a wide variety of sources but notes it is at present difficult to distinguish between local products and imports. However, the most important pottery of this period, Kamares Ware, named early on after the cave on Mount Ida where large deposits were found, is one of the most recognizable ceramics in the world and MacGillivray argues that it was largely produced in the Knossos-Archanes region. Its high-quality, lustrous, black ground surface probably imitates the black luster of oxidized silver and the sharp, crisp forms of many of the shapes certainly look to metal prototypes. In addition, intricate red, orange, yellow, violet and white designs were applied on the dark ground to produce a vivid polychrome effect. This pottery required considerable technical knowledge and skill to produce. It was not for every day use but likely featured in feasting rituals and other celebrations. MacGillivray suggests that Knossos was a center for communal gatherings in this period, not a seat of worldly authority as it would become later. Middle Minoan IB is termed the Early Chamber Beneath the West Court Group and is represented by 15 deposits from many different locations of the palace and town. For the first time there is significant use of the potter's wheel and many more kinds of pottery were produced than before, among them: Barbotine Ware, Shallow Grooved Ware, Early Printed Ware, and greater varieties of Light-on-Dark Ware, as well as the Polychrome or Kamares Ware. The Middle Minoan IIA ceramic phase is termed the Royal Pottery Stores Group and is represented

by 11 archaeological deposits. A hallmark of this phase is 'Egg-shell' Ware, with its exceptionally thin walls of less than a millimeter, which must be the product of a specialized workshop, and is the finest pottery of its time. Another ceramic innovation at Knossos in MM IIA is the creation of Stamped and Impressed Ware and, more generally, the widespread adoption of the potter's wheel. Knossian pottery of this period travels to the Near East and has been found on Cyprus and in the Levant. MacGillivray also sees strong parallels in the silver ware found at Töd in Egypt with MM IB and MM IIA Knossian ceramics.<sup>5</sup> The Middle Minoan IIB ceramic phase is termed the Trial KV Group and is the most difficult to define stratigraphically at Knossos with only four archaeological contexts listed. Most characteristic of this phase is Precision Stamped Ware and polychrome styles on cups and bridge-spouted jars. A good number of contemporary pottery deposits in destruction layers at other sites on the island have been identified and some Knossian pottery exports have been found in the Levant and Egypt, notably at Tell el-Daba'a, where Minoan style frescos also occur, and Abydos. MacGillivray identifies the MM IIIA ceramic phase at Knossos as the West and South Polychrome Deposits Group represented by only six archaeological contexts. MacGillivray now believes that the palace at Knossos was brought down at the end of this period by a seismic event sometime after the destruction of the palace at Phaistos.

The final two chapters of the book -- on the Neopalatial, Final Palatial and Post Palatial pottery from Knossos -- are by Eleni Hatzaki. The Neopalatial period at the site is divided into three distinct destruction horizons: a MM IIIB seismic destruction, a second seismic destruction associated with the Theran eruption in LM IA and a fire destruction at the end of LM IB. Hatzaki argues that the emphasis Popham placed on "type-fossils", specific vessels and types of decorations produced and consumed within the span of a single ceramic phase, does not work so well for the Neopalatial period (MM IIIB-LM IB) since most Neopalatial vessel types and decorative motifs have longer life spans, straddling more than one ceramic phase. Hatzaki elucidates some other terminology issues: notably that in previous scholarship MM IIIB, MM IIIB/LM IA transition, and early LM IA have been used to describe the same thing. Hatzaki does not see stratigraphic or stylistic evidence to support subdivisions of the three main phases as has sometimes been suggested before and as is sometimes possible at other sites like Mochlos in the LM IB period. Instead, Hatzaki proposes a new revised sequence based on three main pottery groups. The MM IIIB ceramic phase is identified as the KS 178 Group, named after a deposit excavated by Colin MacDonald in the early 1990's. It is unfortunate, given the importance of this book, that Hatzaki was unable to study the complete vases from the palace and acropolis houses which are stored in the Herakleion Museum, but Hatzaki states that this only prevented a more detailed discussion of fabrics and formation techniques. One distinctive motif that begins in this phase is the use of ripple decoration as a frieze on lustrous and non-lustrous Dark-on-Light Ware. The LM IA ceramic phase is termed the Gypsades Well (Upper Deposit) Group with 24 diagnostic archaeological contexts listed. This ceramic phase exhibits an increase in use of elaborate decorative motifs, which seem to parallel developments in fresco painting. The reed style and its local variants applied on both fine and coarse wares is a hallmark of this period and one of the main features for distinguishing between MM IIIB and LM IA deposits. The so-called 'Jackson Pollack' or spray-painted style also appears to begin in LM IA and is an example of another distinctive style that continues into the next ceramic phase. EH defines the LM IB ceramic phase as the SEX North House Group. One has to go to the index to learn that SEX stands for Stratigraphical Museum Extension Site. Hatzaki reports that, surprisingly, a detailed LM IB ceramic phase

remains slightly elusive at Knossos because of the relatively small amount of published pottery. However, at a recent conference on LM IB pottery held at the Danish Institute in Athens, Sinclair Hood presented a wealth of unpublished pottery from destruction deposits along the Royal Road. When this material is published it will rectify the situation considerably with a very wide range of pottery shapes and styles as one expects would have been produced at this major palace center during one of its renaissance periods. At present cross-island synchronizations in the LM IB period are still largely defined by the existence of a small group of open and closed vessels in fine buff clay decorated in Marine and Alternating style of the Special Palatial Tradition, the majority of which were probably produced in Knossian potter's workshops.

The last chapter is devoted to the Final Palatial and Post Palatial periods. The Final Palatial period (LM II-LM IIIA2) witnesses the rise of Knossian hegemony as the single functioning palace on Crete. The LM II ceramic phase is called the MUM South Sector Group and with 25 archaeological contexts listed is clearly defined with extensive assemblages. Hatzaki notes that the surface of the pottery is usually less well preserved than those of the LM I and LM III periods. In terms of pottery, links with mainland Greece in this period at Knossos are based more on mainland inspired new ceramic shapes, such as the kylix, trough-spouted jug and squat alabastron, than actual imports. LM IIIA1 is defined as the Long Corridor Cists Group with 17 archaeological deposits. Hatzaki points out that the published pottery of this period provides only part of the picture as it is a highly selective representation of a restricted number of fine and mostly decorated vases. Among these though, the one-handled ledge-rimmed decorated cup and the plain kylix have become 'type fossils' of this ceramic phase. Floral and abstract motifs in Dark-on-Light Ware assume greater prominence while marine themes become less popular. The LM IIIA2 ceramic phase is termed the MUM Pits 8, 10-11 Group. An assemblage of pottery in tomb θ at the Katsambas cemetery demonstrates the co-existence of LM IIIA1 and LM IIIA2 stylistic features and highlights the need to view assemblages in their entirety instead of focusing on individual vessels. Hatzaki reminds us that Popham's palace destruction horizon is an event, not a ceramic phase. It occurred at a time when pottery with stylistic features of LM IIIA1 and LM IIIA2 overlapped. Hatzaki does not believe it is possible at present to support the subdivision of LM IIIA2 into Early and Late as Popham had argued but future research may shed light on this issue.

The LM IIIA2 ceramic phase at Knossos does not have many synchronisms with other Cretan sites because there is so much regionalism in pottery production coinciding with the vacuum caused by the destruction of the palace at Knossos. The best evidence for contacts between LM IIIA2 Crete and the eastern Mediterranean is at Kommos and only a few exports from Crete to Cyprus, the Levant and Egypt are known.

The Post Palatial period is divided into three pottery groups: the Makritikhos 'Kitchen' Group (LM IIIB Early), the MUM North Platform Pits Group (LM IIIB Late), and the SEX Southern Half Group (LM IIIC Early). In the LM IIIB Early ceramic phase, there is generally a decrease in Dark-on-Light Lustrous Ware with a much more limited repertoire of motifs and a much greater predominance of plain wares, which is a trend observed beyond Knossos at this time. Hatzaki's presentation of the LM IIIC Early ceramic phase is based only on preliminary reports as the deposits of this phase have not yet been fully published. At present there is no evidence for an LM IIIC Late ceramic phase at Knossos. The Sub-Minoan pottery from the site is essentially contemporary with the beginning of the Early Iron Age in the rest of Greece. The CD attached to the back

cover of the book contains an additional 187 illustrations, many in color but of varying quality, and forms an extremely useful supplement to the book.

**Notes:**

1. J.N. Coldstream, L.J. Eiring, and G. Forster, *Knossos Pottery Handbook: Greek and Roman*, British School at Athens Studies 7, London, 2001.
2. Momigliano has done considerable research on the MacKenzie --Evans relationship. See N. Momigliano, *Duncan Mackenzie. A Cautious Canny Highlander & the Palace of Minos at Knossos*, Institute of Classical Studies, School of Advanced Study, University of London, London, 1999.
3. Philip P. Betancourt, *The History of Minoan Pottery*, Princeton University Press, Princeton, 1985, pl. 1a, c, f.
4. J.A. MacGillivray, *Knossos: Pottery Groups of the Old Palace Period*, British School at Athens Studies 5, London, 1998.
5. On the Tôd treasure, see now J. Aruz, et al., eds., *Beyond Babylon: Art, Trade and Diplomacy in the Second Millennium B.C.*, The Metropolitan Museum of Art, New York, 2008, pp. 65-69; see also p. 60, catalogue no. 32 with color illustration, for the Kamares Ware bridge-spouted jar from Byblos mentioned by JAM on p. 140.

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# **EVIDENCE FOR THE TRADE OF MESOPOTAMIAN AND EGYPTIAN GLASS TO MYCENAEAN GREECE**

Evidence for the trade of Mesopotamian and Egyptian glass to Mycenaean Greece M.S. Walton<sup>a</sup>, Corresponding Author Contact Information, E-mail The Corresponding Author, A. Shortland<sup>b</sup>, S. Kirk<sup>b</sup> and P. Degryse<sup>c</sup> Getty Conservation Institute, Los Angeles, CA, USA <sup>b</sup>Department of Materials and Medical Sciences, Center for Archaeological and Forensic Analysis, Cranfield University, Shrivenham, Swindon, Wiltshire, UK <sup>c</sup>Geology, Earth and Environmental Sciences, K.U.Leuven, Belgium

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Available online 10 March 2009.

## **Abstract**

The origins of raw glass used to fashion Mycenaean beads were explored using trace elements analyzed by laser ablation ICP-TOFMS. The use of this minimally destructive technique for the in-situ analysis of these beads was ideal given that the material is exceedingly rare and thus too sensitive to make use of traditional micro-sampling (e.g., by scalpel). A wide range of trace elements were measured to compare these Greek glasses to other Late Bronze Age glass coming from Egypt and Mesopotamia. Of the eleven beads analyzed, four blue glasses colored with cobalt and two blue/green glasses colored with copper have trace element compositions consistent with an Egyptian origin of manufacture. The other five of the glasses, all colored with copper, were found to conform to the composition of Mesopotamian glass. These data are the first to demonstrate direct and clear evidence for the trade of raw glass to the Mycenaean states.

Keywords: Glass; Late Bronze Age; Mycenaean Greece; Egypt; Mesopotamia; LA-ICP-TOFMS Article Outline

1. Introduction
  2. Archaeological background
  3. Previous analysis of Mycenaean glass
  4. Experimental
  5. Results/discussion
    - 5.1. Visual appearance
    - 5.2. Major element chemistry
    - 5.3. Trace element chemistry
  6. Archaeological implications
  7. Conclusions
- Acknowledgements  
References



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## **HISTORY OF MEDICINE**

Akhenaten and the Strange Physiognomies of Egypt's 18th Dynasty Irwin M. Braverman, MD; Donald B. Redford, PhD; and Philip A. Mackowiak, MD, MBA

### **Annals of Internal Medicine**

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Akhenaten was one of Egypt's most controversial pharaohs, in part because of his strange appearance in images produced after he had declared Aten, the Sun-disc, his one-and-only god. Whether these were symbolic representations or realistic ones that indicate a deforming genetic disorder is the subject of continuing debate. The authors present evidence that the bizarre physical features portrayed in these images are not only realistic but were shared by many members of Egypt's 18th Dynasty. The features are best explained by either 2 different familial disorders—the aromatase excess syndrome and the sagittal craniosynostosis syndrome—or a variant of the Antley–Bixler syndrome caused by a novel mutation in one of the genes controlling the P450 enzymes, which regulate steroidogenesis and cranial bone formation.

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## ANCIENT GREEK COSMOGONY, ANDREW GREGORY

Scholia Reviews 18 (2009) 13.

Andrew Gregory, *Ancient Greek Cosmogony*. London: Duckworth, 2008. Pp.xii + 314. ISBN 978-0-7156-3477-6. UK£50.00. Further Details.

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The question of the origin of the universe continues to attract us. In quantum mechanics, we are presented with hypotheses of parallel universes, multiverses, ‘many worlds’, which imply a notion of universes before or after our time, and of multiple ‘creations’ and the possibility of sempiternity (perpetual time).[[1]] The very first moments of cosmic birth are the object of great, and expensive, interest, as we await results from running the Large Hadron Collider near Geneva in the hope of gaining an inkling about what happened in the first millionths of a second of the beginning of the universe. [[2]] While strictly a question of what happened after birth rather than of the birth itself, of cosmology rather than of cosmogony, the issues are not unrelated. Nor are they new. It is well to be reminded by Andrew Gregory’s excellent book how long-standing and perennial are some of the questions surrounding the universe’s origins. Throughout this book there is an engaging allusion to modern cosmological concerns -- sufficiently frequent for Big Bang, Quantum Mechanics and Steady State to be granted their own abbreviations (BB, QM and SS).

Gregory necessarily starts with a caution about what his book is about, and what it is not about. Fundamentally, it is ‘about ancient theories of how the cosmos began’ (p. xi). The book is not about Greek philosophy, nor about Greek science, although, of course, these will inform the discussion. Neither, for that matter, is it a book about Greek mythology or theogony, inasmuch as the cosmos is subject to the caprice of the gods, nor about Greek cosmology, insofar as this entails questions of the nature and organisation of the cosmos, aspects of interest to philosophy and science. Nonetheless, Gregory does not ignore what these other resources can offer. Mythological accounts of creation form the focus of chapter 1. Despite the strong evidence for Oriental influence on Greek thought, and in this context particularly on Greek cosmogony, Gregory nonetheless argues for Greek innovation in the realm of philosophical cosmogony.

Chapters 2–8 (pp. 26–139) -- about half the book’s text -- deal with the Presocratics, and we enter the realm of the uniquely Greek philosophical engagement with cosmogony, where the protagonists often appear to be conversing and arguing with one another. In Chapter 2 Thales, Anaximander and Anaximenes introduce the concept of multiple kosmoi, a concept with which we may still engage, as I indicated earlier, even if, as Gregory warns us, our explanations (and our very understanding of what constitutes an explanation) may differ. Gregory also argues for all three Milesians eschewing chance in the emergence of the kosmos and instead believing in ‘an active originative substance’ (p. 56). In Chapter 3 Gregory finds evidence for distinguishing Heraclitus as not only not following the Milesian multiple kosmoi theory but also not believing in a beginning to

the kosmos, and therefore having no cosmogony whatever. Parmenides, Empedocles and Anaxagoras occupy Chapters 4, 5 and 6 respectively, and with these figures Gregory engages more thoroughly with the fragmentary and often difficult literary evidence. With Parmenides we encounter for the first time the rejection of creation from nothing (*ex nihilo*), an issue of considerable importance much later. Gregory emphasises how radical and problematic Parmenides' cosmogony is, until it is countered by the correspondingly radical Christian notion of a god who creates time and space along with matter. The idea of successive kosmoi is promoted by Empedocles, along with a role for chance, which generates non-identical kosmoi. Contemporaneously, Anaxagoras accepts only a single kosmos, and is the first to ascribe to an independent intelligence a role in its creation. Chapter 7 discusses two figures, Leucippus and Democritus, the originators of atomism. The two (Gregory does not seek to distinguish the indistinguishable) explore the novel idea of an unlimited number of co-existent kosmoi (in contrast to Empedocles' unlimited number of successive kosmoi), and influentially seek to establish a principle of accidental occurrence for the origin of these worlds. Chapter 8 mops up a few stray Presocratics -- Xenophanes, the Pythagoreans, Archelaus, Diogenes of Apollonia, and the elusive author of the Derveni papyrus -- among whom little innovation is discernible for Gregory.

The second half of the book (Chapters 9–14) then cover successively Plato, Aristotle, the Epicurus (via Lucretius), the Stoics, early Christianity in general, and finally the Neoplatonists and Christians (Sallustius, Philo, Proclus, Philoponus, Plutarch, Theophilus, Tertullian, Hermogenes, Origen and Augustine -- in that order, to suit Gregory's themes, rather than in chronological order). A Conclusion (Chapter 15) draws the major concepts of ancient Greek cosmogony together. Plato rejected multiple kosmoi and accidental origins, and instead argues influentially for a single kosmos created by a divine 'craftsman'. Aristotle, on the other hand, while promoting a single kosmos, argued for its eternity (on the now unsustainable grounds of 'natural' place and motion) and thus for no cosmogony as such. The difficulties Aristotle had in entertaining the notion of a cosmogony find their parallels, Gregory demonstrates, in modern physics. Epicurus pursues the atomist tradition, refining it and responding to criticisms of Leucippus and Democritus. He reinstates a cosmogony without god, as well as multiple kosmoi. While his influence will be relatively small in later antiquity, Gregory finds that his concerns resonate in some aspects of modern cosmology. Stoic cosmogony, like that of the Presocratics, is unfortunately known mainly through fragments. It supports cyclical regeneration of the kosmos, innovatively through the fiery, phoenix-like process of *ekpurôsis*. Christianity reintroduces the notion of creation *ex nihilo*, although, Gregory argues in his analysis of the interpretation of Genesis 1: 1–12 in Chapter 13, it was not always a core concern. Creation from pre-existent matter was considered, as was the activity of god before the creation of the kosmos. Christian thinkers introduce the idea of an absolute beginning for time, space and matter in the act of creation, which makes any question of 'before' creation meaningless, as Augustine famously pointed out.

The chapters are supported by extensive notes (pp. 247- 82), and a useful bibliography. I would have preferred to see the ancient sources differentiated, but this deficiency is well countered by a very helpful index locorum (a Duckworth feature), an index of names, and a good general index.

Gregory explores all the issues with care and clarity. Original texts are presented in clear translations. Problems are unbundled, solutions offered, and remaining issues honestly

acknowledged. Innovation is emphasised at appropriate points, and in some unusual places at times. The nod to modern concerns is not superficial but serious, and while the intricacies of modern physics are naturally simplified, Gregory does not avoid mentioning them. This may not be a textbook by design, but it deserves to be one in courses in the history and philosophy of science, and indeed in philosophy in general.

## NOTES

[[1]] See Martin Bojowald, ‘What happened before the Big Bang?’ Nature Physics 3.8 (August 2007) 523–25; Paul J. Steinhardt and Neil Turok, Endless Universe: Beyond the Big Bang (New York 2007); Michio Kaku, Parallel Worlds (New York 2005); Martin Rees, Before the Beginning: Our Universe and Others (London 1997).

[[2]] The attempt was begun on 10 September 2008 with the aim (in layman’s terms) ‘to smash protons moving at 99.999999% of the speed of light into each other and so recreate conditions a fraction of a second after the big bang’, but had to be aborted on 19 September, and is due to resume ‘not . . . before spring 2009’ (<http://lhc.web.cern.ch/lhc/>).

**Please visit the site:** <http://www.classics.ukzn.ac.za/reviews/09-13gre.htm>

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## **EΙΔΗΣΕΙΣ - NEWS RELEASE**

### **WORKING ON COPTIC ARCHIVES**

Nevine El-Aref reports on the completion of the first inventory to assess the current condition of manuscripts stored for almost a century in the Coptic Museum archives

The Coptic Museum archives, considered to be the world's most important Coptic library and containing more than 5,000 manuscripts and books, are being given a facelift.

Serenity, peace and complete quiet are the overwhelming sensations in the museum library, despite the presence of two dozen experts and restorers who have spread themselves to each corner of the reading room. Since January, the library has been converted into a scientific laboratory so that a comprehensive survey to assess the current conditions of its treasured manuscripts and books can be carried out.

Armed with white gowns, masks, small brushes, glass plaques, small pieces of cottonwool and special liquids, junior and professional restorers sit in front of their improvised desks examining the piece of manuscript in their hands. They are looking for parts of each manuscript that show signs of being infected, and then they will identify its causes, take notes and rescue the pieces that are in need of attention.

"I am very happy to be taking part in such a great project," Hamdi Abdel-Moneim, an expert in manuscript restoration, told Al-Ahram Weekly. He added that during his 22-year career in restoring Islamic manuscripts, it was the first time he had come face to face with Coptic pieces. "They are totally different than each other,"

Abdel-Moneim said, pointing out that Copts used goatskin or manuscripts while Muslims, writing at a later date, used paper, which required different maintenance and restorative treatment. "I have examined almost 30 per cent of the stored collection," Abdel-Moneim said, "and I have realised that the condition of the Coptic manuscripts is worse than Islamic ones since they have been handled more often by monks and other churchgoers. But Islamic ones are much better preserved since they have been kept in hard covers, like the Quran for example."

Abdel-Moneim noted that spots of wax and oil are easily seen on the manuscripts, while others had been attacked by insects. Ten per cent of the stored collection was badly damaged and required an immediate attention, since the goatskin interacted with itself, thus transformed into gelatin, which made it beyond repair. He said the books were in better condition but many had wax and water spots as well as holes and tears.

"The project also is trying to adjust the incorrect restoration implemented during the 'era of the Martyrs' in about 1600, when monks glued the manuscripts to sheets of paper in an attempt to support them. Regretfully, however, this treatment led to the deterioration of some parts of the manuscripts, while some others were lost in the process.

"Dealing with more than 5,000 priceless manuscripts at once really is a challenge," Nadja Tomoum, head of the project told the Weekly. She added that the project was a result of the initiative launched by the friends of the Coptic Museum, who submitted the proposal. The project is being carried out with the collaboration of the Getty Foundation, which is

well-known in the field and not only aims at assessing the condition of the treasured archive collection but also identifying the problems and finding solutions for future treatments. It will also examine the environmental condition of the archive in order to provide the optimum and most suitable environment for the preservation of its collection. Tomoum pointed out that a good many improvements were required to combat the high rate of humidity and install an air conditioning system, temperature control and suitable storage cabinets. In collaboration with experts from the Mënster University in Germany, a data base for a professional cataloguing system will also be among the elements of the project. Tomoum said three studies were carried out last year to catalogue the manuscripts by classifying the contents and identifying texts. A new numbering system known as Getty Numbers will be employed for cataloguing the collection, as each item can have more than one number which is confusing. These old numbers would be left as they were, Tomoum said, because for some Coptologists these were their documentation numbers. The Getty Numbers would be a new numbering system to access the stored items, some of which were not yet published. Tomoum promised that at the end of this year another campaign would be implemented to restore and correctly preserve the collection.

"It is really a very important step, and the first one towards refurbishing the Coptic Museum archive," Tomoum commented.

Marwa Mahmoud, a junior restorer who began her career five years ago, described the project as a free training course for her generation of restorers. "I have learnt how to hold a manuscript, how to deal with it and how to protect it during the maintenance process," Mahmoud said. "It has also raised made my eyes more sensitive when it comes to identifying the damage, even if it is hidden or not clear."

Restorer Kamal Mohamed had a similar view of the project. "It's a great opportunity to examine a large amount of manuscripts of various materials: papyrus, paper, fabrics and goatskin, as well as knowing different types of infections," he said. "It has taught me how to carry out a complete and comprehensive survey of manuscripts through applying a digital 'birth certificate' that assesses its size, material and current condition as well as suggesting future treatments. It is not only a scientific experience but an encouraging project as well." Mohamed said it helped boost their confidence by providing a chance for decision-making and assessing the methods for direct intervention to rescue very damaged items.

Nagah Ragab said the project had shown them the latest technology used in restoring manuscripts and books, but for restorer Sherine Lyon it was a means to reschedule their thoughts about ways of dealing with very sensitive items like the manuscripts.

Julie Miller from Michigan University told the Weekly that the aim of the project was to provide a better home for the priceless collection, with an improved environment and better conditions. It was also a way of developing the skills and knowledge of Egyptian curators as well as training junior colleagues.

"I am delighted with the project," said Pamela Spitamuelles from Harvard University. She said it was invaluable to see different kinds of ancient covers with special decorations that she had not seen it before.



"It is a dream to come true," said Coptologist Zefreg Ritcha at Münster University. "In 1925 when I was a student I dreamt of working at the Coptic Museum archive, and now it has happened."

He said his input to the project was to delve into the context of each item, and not only its content. This meant he deciphered the text, explained it, located the site where it was found, and identified the leaves. "Most of the manuscripts I examined were private letters with missing parts so that a person couldn't follow up the story," he said.

"It is really disappointing as some of these letters highlight the lifestyle of the era or the kind of commerce then," Ritcha said.

He explains that he is also implementing the new cataloguing system, since some manuscripts have two different numbers which is confusing for students and Coptologists. "We will keep these numbers and insert another number proceeded with letter G in order to identify it as the Getty Number," Ritcha said. He explained that through exploration of the archives, a collection of 20 unpublished manuscripts had been assessed. "No one knew about it," he pointed out, adding that some of the manuscripts had long texts from the Old Testament or Nubian texts.

"It is not just a restoration project but is my rebirth certification," Kamilia Makram, the library director, told the Weekly.

"Since it was established in the 1990s no one has touched upon the library collection. Even during the comprehensive restoration project to renovate the museum and its collection after almost 10 years of closure, no one had touched the library, and when I asked why they said there will be a special project for it. Following three years of its re-opening my dream is fulfilled."

**Please visit the site: <http://weekly.ahram.org.eg/2009/945/heritage.htm>**

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## **THE FINAL COLLAPSE OF BYZANTIUM,** **HÜRRIYET DAILY NEWS**

ISTANBUL - More than half of the Byzantine buildings in the Marmara region have been damaged, according to a report released yesterday by a volunteer group, the Archaeological Settlements of Turkey Project, or TAY.

There are 336 buildings in the area dating from Byzantium that have been severely damaged, TAY coordinator Oğuz Satici said in a press conference on the group's report, "Archeological Destruction in Turkey, 2008, Marmara Region Byzantine Period." The region contains more than 450 buildings that were created the Byzantines. In Istanbul, Satici added, more than 160 buildings from the Byzantine period have been exposed to damage. The TAY team has found 36 buildings or remnants in the area that were not detected before.

TAY is composed of academics who voluntarily document and assess the damage done to archeological sites in Turkey. Around 20 volunteers worked for five years to document the data for the new report.

The majority of the damage is done due to urban construction at the hands of the state, Satici said. The building of new settlements accounts for 33 percent of the damage while the construction of highways, roads and bridges creates 20 percent. Natural causes make up 19 percent, while secondary usage, such as using an old monastery as a sheep pen or a depot, causes 12 percent of the destruction.

An authority gap in the protection of Byzantine-period buildings causes irreversible damage, said Engin Akyürek, a member of the TAY team and an academic from Istanbul University.

The TAY report shows how historic buildings or their remnants have become almost invisible as they have been used for other purposes or become seriously damaged. Boğdan Palace is one example. The entrance of the palace, which is part of a 13th-century Byzantine church located on Draman Street in the Fatih district, is being used as a tire repair shop.

**Please visit the site:**

**<http://www.hurriyet.com.tr/english/domestic/11534871.asp?scr=1>**

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## **PERSEPOLIS FORTIFICATION** **ARCHIVE DIGITIZED WITH MELLON** **FOUNDATION SUPPORT**

"The Oriental Institute at the University of Chicago is using modern technology to digitally record thousands of tablets that, as they are being pieced together, tell an unusually detailed story of the Persian Empire.

These ancient tablets from the palaces of Persepolis include pieces of language and art from the center of the Persian Empire, all made when it extended from India and Central Asia to Egypt and the Mediterranean. Most have texts in impressed cuneiform characters, many them have inked texts in Aramaic writing and almost all of the tablets have seal impressions.

They are now being recorded and distributed with digital processes that will allow scholars and viewers across the world to examine them as if they had picked them up and rotated under a light..."

Please visit the site: <http://persepolistablets.blogspot.com/2009/04/ancient-persian-archive-digitized-with.html>>:[Go there for the full story, with pix]

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## **NEFERTITI'S 'HIDDEN FACE' PROVES BERLIN BUST IS NOT HITLER'S FAKE**

Hamburg- Using 21st Century medical computer technology, German researchers have unveiled the "hidden face" below the surface facial features of the famed bust of 18th Dynasty Queen Nefertiti - dispelling once and for all nagging rumours that the bust might be a duplicate made at the orders of Adolf Hitler in the 1930s, and that the genuine bust was lost in the chaos following World War II. The researchers from Berlin's Imaging Science Institute at Charite Hospital made a series of CT scans of the bust and confirmed findings of a less sophisticated CT scan 17 years ago which revealed that the sculpture has a limestone core and is covered in layers of plaster-like stucco, called "render" by Egyptologists.

That finding was not new. But what was new is the fact that the new CT scan revealed that the limestone core was carved with such artistic precision that it forms a veritable inner copy of the outer face.

Now the Berlin experts are wondering whether the original artist originally carved the bust in limestone, but then changed his mind and added a plaster glaze which gave the queen softer and more rounded features. The experts say the limestone facial features are a bit more angular.

It is a question which may never be answered. But the latest CT scan does answer the lingering question as to whether the bust, which forms the cornerstone of Berlin's Egyptian collection, is genuinely 3,300 years old - or whether it is a fake made 70 years ago as part of a scheme by the Nazi fuhrer to assuage Egyptian ire by giving them a fake bust of Nefertiti, while Hitler kept the original for his own private collection.

No 20th Century artist would go to the extraordinary trouble of carving a limestone bust in exquisite detail and then hiding it below a coat of plaster. For years, the Berlin officials have argued that chemical tests showed the paint and plaster on the bust were identical to those used by Ancient Egyptian artisans. Now they also have computer-backed evidence that the limestone carving is also genuinely ancient.

Egypt has demanded the return of the bust since it went on display in 1923 in Berlin at the height of worldwide "Egypto-mania" in the wake of the discovery of the tomb of Tutankhamen by Howard Carter.

The painted limestone and plaster bust, depicting the elegantly chiselled life-sized features of a stunningly beautiful woman wearing a unique cone-shaped headdress, has been the pride of the collection since German archaeologists discovered the bust in the ruins of an ancient artist's studio on the banks of the Nile in 1912.

An alluring mystery has surrounded the bust since its discovery on December 7, 1912, incredibly intact and sporting vibrant colours, after lying forgotten in the sands since the tumultuous close of the reign of Pharaoh Akhenaton, one of the most enigmatic rulers of all time.

In 1913, the Ottoman Empire agreed to allow its finders, part-time German-Jewish archaeologist and full-time entrepreneur James Simon and his Prussian colleague Ludwig Borchardt, to retain possession of the bust.

The simmering controversy between Egypt and Germany boiled over anew earlier this year when a German news magazine printed excerpts from documents which allegedly indicated Borchardt deliberately used subterfuge to "smuggle" the bust out of Egypt. The documents are not new to scholars, however, who say Borchardt and Simon did not need to be devious. Instead, the Ottoman Empire officials simply failed to appreciate the artistic value of the artefact.

Despite persistent rumours that Borchardt and Simon smuggled out the bust under a coating of mud, the plain truth of the matter is that Ottoman authorities failed to recognize the bust as a masterpiece. In those days, the stark style of the Amarna Period was not deemed as valuable as the more traditional styles of other periods.

Borchardt and Simon, however, immediately recognized the bust's appeal to European tastes for Art Nouveau and other post-Victorian styles.

They did indeed breathe a sigh of relief when the Ottoman authorities blindly gave their stamp of approval to their request for removal from Egypt.

Borchardt and Simon carted it off to Europe where Simon displayed Nefertiti prominently in his home in Berlin before later lending it to the Berlin museum and finally donating it to the Berlin collection in 1920.

The discovery of Tutankhamen's tomb in 1922 spawned an Egypto-mania craze as well as the Art Deco style. King Tut's treasures flaunted the "decadent" style of the late 18th Dynasty, and Nefertiti suddenly was a fashion trend-setter.

Crowds flocked to the Berlin museum to see Nefertiti and shame-faced Egyptian authorities realized they had made a ghastly mistake a decade earlier.

"They suddenly realized that this bust, which had been dismissed as 'un-Egyptian' in 1913, was in fact one of the most exquisite examples of Egyptian art," the Berliner Zeitung newspaper quoted one expert as saying.

In 1933, the Egyptian government demanded Nefertiti's return - the first of many such demands over the ensuing decades. One of the many titles Hermann Goering held was premier of Prussia (which included Berlin) and, acting in that capacity, Goering hinted to King Fouad I of Egypt that Nefertiti would soon be back in Cairo.

But Hitler had other plans. Through the ambassador to Egypt, Eberhard von Stohrer, Hitler informed the Egyptian government that he was an ardent fan of Nefertiti:

"I know this famous bust," the fuhrer wrote. "I have viewed it and marvelled at it many times. Nefertiti continually delights me. The bust is a unique masterpiece, an ornament, a true treasure!"

Hitler said Nefertiti had a place in his dreams of rebuilding Berlin and renaming it "Germania".

"Do you know what I'm going to do one day? I'm going to build a new Egyptian museum in Berlin," Hitler went on.

"I dream of it. Inside I will build a chamber, crowned by a large dome. In the middle, this wonder, Nefertiti, will be enthroned. I will never relinquish the head of the Queen."

While he did not mention it at the time, Hitler envisioned more for the museum. There was to be an even larger hall of honour, with a bust of Hitler.

It was rumoured immediately after World War II that Hitler had commissioned a copy of the bust for possible handover to the Egyptians after a Nazi victory. American Allied art experts claimed they found two wooden crates in a salt mine south of Berlin where the German capital's museum art treasures had been placed for safekeeping during bombing raids. The two crates allegedly contained identical Nefertiti busts.

But in post-war confusion, one of the crates got lost. The whereabouts of the "other Nefertiti" are unknown - assuming it ever existed to start with. From time to time over the years, there have been reports suggesting that the fake bust survived and that the genuine bust is lost. A recent documentary on Germany's ZDF television network revived that theory.

And that is where the new CT scans come to the rescue. They prove once and for all that the bust on view in Berlin is indeed genuine. Whether there ever was a duplicate is now a moot point.

The exquisite limestone bust of Queen Nefertiti forms the focal point of the Berlin collection, which ranks among the top two or three collections in the world outside Egypt itself. The British Museum, the Louvre in Paris and the Metropolitan in New York are the only chief rivals to Berlin's collection, which spans all eras from the pre-Dynastic period all the way through to Roman times.

Hitler's dreams of a monolithic new Egyptian museum never materialized. Instead, Nefertiti will move into permanent quarters in Berlin's Neues Museum later this year, following painstaking renovation work to erase wartime damage.

Ironically, it will be the first time since 1939 that the entire Berlin Egyptian collection will be housed in one permanent location.

Hitler and his mad dreams are long dead. But Nefertiti continues to smile serenely. As she has for 3,300 years. As if to say: "This too shall pass. And I shall endure."

**Please visit the site: <http://www.earthtimes.org/articles/show/266036,nefertitis-hidden-face-proves-berlin-bust-is-not-hitlers-fake.html>**

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## **IS THIS NEFERTITI – OR A 100-YEAR- OLD FAKE? KATE CONNOLLY IN BERLIN**

Her elegant and chiselled features held proud and high on a swanlike neck, she has been smiling serenely for 3,400 years. At least that has long been the popular and scientific belief that draws half a million tourists to see her in Berlin every year.

But now doubt has been thrown on the authenticity of the painted limestone and plaster bust of the 18th dynasty Egyptian queen Nefertiti by two authors who claim she is a fake.

According to a Swiss art historian, the bust is less than 100 years old. Henri Stierlin has said the stunning work that will later this year be the showpiece of the city's reborn Neues Museum was created by an artist commissioned by Ludwig Borchardt, the German archaeologist credited with digging Nefertiti out of the sands of the ancient settlement of Amarna, 90 miles south of Cairo, in 1912.

In his book, *Le Buste de Nefertiti – une Imposture de l'Egyptologie?* (The Bust of Nefertiti – an Egyptology Fraud?), Stierlin has claimed that the bust was created to test ancient pigments. But after it was admired by a Prussian prince, Johann Georg, who was beguiled by Nefertiti's beauty, Borchardt, said Stierlin, "didn't have the nerve to make his guest look stupid" and pretended it was genuine.

Berlin author and historian Edrogon Ercivan has added his weight to the row with his book *Missing Link in Archaeology*, published last week, in which he has also called Nefertiti a fake, modelled by an artist on Borchardt's statuesque wife.

Public and political enthusiasm about the find at the time gave the artefact its "own dynamic" and led to Borchardt ensuring it was kept out of the public gaze until 1924, the authors have argued.

He kept it in his living room for the next 11 years before handing it over to a Berlin museum, since when it has been one of the city's main tourist attractions.

The statue was famously admired by Adolf Hitler, who referred to it as "a unique masterpiece, an ornament, a true treasure".

Recent radiological tests carried out on the statue by Berlin's Charite hospital supposedly proved that the bust is indeed more than 3,000 years old. The tests uncovered a hidden face carved into the statue's limestone core. But Stierlin has argued that while it is possible to carbon date the pigments, which appear to be ancient Egyptian, it is impossible to accurately date the bust because it is made of stone covered in plaster.

Other aspects of the find, which he has claimed support his theory, are the facts that the bust has no left eye, which the ancient Egyptians would have considered a sign of disrespect towards their much-loved queen, and that the first scientific reports on the discovery were not written up for 11 years.

Borchardt's diary entries remain the main written account of the find.

He wrote: "Suddenly we had in our hands the most alive Egyptian artwork. You cannot describe it with words. You must see it."

But Dietrich Wildung, the director of Berlin's Egyptian Museum, where Nefertiti is currently housed, has fiercely dismissed the allegations as an attempt to exploit the bust's popularity. "A beautiful woman and a putative scandal," he said. "That always sells."

He said the claims could easily be dismissed because of the detailed computer tomography and material analyses that had been carried out on Nefertiti.

In October, the bust is due to be moved back into the Neues Museum, which has been reconstructed from its war-torn remains by British architect David Chipperfield, and where Nefertiti was last on display 70 years ago. She is to hold court over a long gallery in the north cupola, where she will be set on a specially constructed pedestal.

Over the decades Germany has rejected repeated requests from Egypt for her return.

Sun queen

The bust is said to portray the wife of the Sun King Akhenaten, with whom she is believed to have ruled Egypt between 1353 and 1336BC. It is thought to have been uncovered in the desert by the archaeologist Ludwig Borchardt in 1912. During the Nazi years, Luftwaffe chief Hermann Goering planned to give it back to Egypt, but Adolf Hitler said the bust would have pride of place in a museum for Germania, the expanded Berlin that was due to be the capital of his Thousand Year Reich. Nefertiti means "beautiful woman has arrived".

**Please visit the site:**

<http://www.guardian.co.uk/artanddesign/2009/may/07/nefertiti-bust-berlin-egypt-authenticity>

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## **BERLIN'S NEFERTITI DEBATE, CALLING THE QUEEN'S AUTHENTICITY INTO QUESTION, BY CHRISTOPH SEIDLER**

For decades, people have marvelled at the bust of Nefertiti. Now, some scholars say it's a fake -- made to hold a necklace. Museum scientists are eager to prove these theories wrong, but the mysterious statue might not be ready to reveal her secrets yet.

Of course they copied her. You can see it clear as day. At the Altes Museum on Berlin's Museum Island, a brief film runs in a silent loop on a monitor. It shows laboratory workers handling a replica of the Nefertiti bust built to test a new portable base for it. The monitor is part of a current display at the museum, one which includes four work stations set up in a large, glass cubicle to show just how complex conserving great works of ancient art is.

Museum visitors can look over the shoulders of specialists to see how the secrets of these old artifacts are revealed using infrared spectroscopy, X-ray fluorescence and microscopy. The Nefertiti bust itself is only a few steps away. The piece, which bears inventory tag number 21300, is one of the most famous pieces of art from ancient Egypt. And in recent weeks, its authenticity has been the subject of much debate.

A sign next to the lab workers reads "Questions Welcome." And Henri Stierlin, a Geneva-based author, certainly does have a few questions.

Stierlin is interested in the Nefertiti copy, and he's not referring to the white model of the bust shown in the film flickering across the monitor. His suspicions run deeper.

In a recently published book, Stierlin claims that Berlin's famous Nefertiti bust -- one of the prides of the city's world-class collection of museums -- is actually a fake. Stierlin claims that Ludwig Borchardt, the leader of the excavation that found Nefertiti, had the sculptor Gerhard Marcks make the bust in 1912 to serve as a display piece for a necklace that had recently been unearthed. "Until then, one could only see Nefertiti as she was depicted on bas reliefs," Stierlin told SPIEGEL ONLINE. "Borchardt wanted to see her in three dimensions."

Stierlin's theory sounds exciting -- and it has proven adept at generating headlines. He says that when Johann Georg, a Saxon duke, visited the tomb in the Egyptian city of Amarna, they were immediately taken by the beauty of the bust. Borchardt, rather than exposing the naiveté of his royal guests, elected to keep the truth to himself.

Art historians have their doubts about this theory. "As to whether Nefertiti is a fake, I can't say for sure," says Ari Hartog, the curator of the Gerhard Marcks Haus, an art museum in Bremen devoted to the works of the famous 20th century German sculptor. Stierlin's theory has been lent credence by the fact that Borchardt's expedition included someone named Marcks. Hartog, though, says it was most likely the artist's brother. If the

Nefertiti bust is indeed fake, says Hartog, "it's definitely not something made by Marcks."

### **You Can Prove A Fake, But Not An Original**

Dietrich Wildung, the curator of the Berlin's Egyptian Museum -- and a long-time friend of Stierlin -- is even more emphatic in his dismissal of Stierlin's ideas. "We would not put an even remotely questionable object on display for 700,000 visitors to see every year," Wildung says.

Despite such doubts, Stierlin refuses to back down. "It's dishonest to display this object when you know it's not authentic," Stierlin insists.

One might think that the debate is superfluous -- that the matter could be settled simply by testing the bust's age. Unfortunately it's not so simple. And its further complicated by the fact that, the closer one considers the Nefertiti bust, the clearer it becomes that very little is known about it.

"You can prove a fake, but you can't prove originals. That's an epistemological problem," Stefan Simon told SPIEGEL ONLINE. Simon is a material scientist who directs the Rathgen Research Laboratory, which belongs to the association of national museums in Berlin. As a scientist, Simon's main allegiance is to the evidence. At the same time, though, his employers have a clear interest in disproving Stierlin's theory.

That, though, is a difficult prospect. Radiocarbon (C-14) dating measures the decay of radioactive carbon isotopes, necessitating samples of organic material. Nefertiti, though, is largely free of such material. A bit of wax was allegedly found in Nefertiti's right eye. When it was carbon-dated a few years back, scientists concluded that might be more than 3,300 years old.

Still, the wax sample's path from the bust's eye to the laboratory was long. It was obtained in 1920 by Friedrich Rathgen, the chemist who first directed the laboratory that now bears his name. For decades, Rathgen's sample lay in a small specimen bag in the museum before finally being dated, opening the door to doubt.

### **Debating the Evidence**

The paint used on the bust yields even fewer clues as to its age. The pigments are all made from minerals, meaning carbon dating cannot be used. Simon points to the network of fissures and cracks in the paint on the surface of the bust. "I cannot imagine that one could reproduce that artificially," he says.

But Stierlin is unimpressed by such details. "People who know how to counterfeit paintings can also reproduce this craquelé effect," he says, referring to an artistic technique that makes surfaces show very small breaks so as to seem old.

Simon also points out that the complicated painting technique used on the bust, leading him to believe that it much older than 100 years.

Under a microscope, Simon has found at least five different layers of paint layered one upon the other: first a layer of white paint with blue undertones, then white, then yellow, then blue, then red.

"Everyone knows that Borchardt possessed large quantities of pigment," Stierlin counters. He claims that Borchardt used the samples for experimentation.

The organic agent used to bind the paint is also not available in sufficient quantities to enable testing. The traces of straw in Nefertiti's headdress could, in theory, also be used. But testing would have to be refined such that only a very tiny amount of material is used to avoid harming the bust, Simon says.

And then there's the matter of the left eye. According to Stierlin, Nefertiti never had a left eye. The right is made from quartz and beeswax darkened with soot. If there was a bit of telltale wax where the left eye once was, it could be tested. But up to now, no one has tried -- perhaps out of fear of damaging the statue. Simon says that there are traces of paint of the same type used in the right eye.

The sculpture is composed of the so-called Amarna-mix, a blend of gypsum anhydride plaster applied on top of a limestone base. The material is named after Tel el-Amarna, a small city in central Egypt founded by Pharaoh Akhenaton in the 14th century B.C. That is also where the bust of his queen would be found in 1912.

"This special blend was unknown before 1912," said Simon says, which would mean that Borchardt and his contemporaries could not have known its exact composition. Currently, researchers are comparing material used in the Nefertiti bust with that utilized in statues of her husband, Akhenaton, and other artifacts from the Amarna period. A model of her husband is also currently in Berlin -- lying in storage in much worse condition.

The secrets held by Nefertiti seem almost endless, despite the bust having been an object of all manner of tests for years. Why, for example, was so much orpiment, a toxic arsenic sulfide, used in the yellow paint? And just how solid is the bust? In a recent examination using a remote sensing technique known as video holography, Simon and his colleagues found damaged areas around the statue's headdress and upper chest. The scientists are particularly worried about the condition of the layered paint, bits of which have been flaking off for years.

### **One Mysterious Lady**

The debate about Nefertiti's authenticity is not likely to go away any time soon. The emblematic character that makes her so attractive also makes her the perfect blank slate for theories like Stierlin's. And he's not alone, as the Berlin-based historian Erdogan Ercivan also maintains that the bust is a fake. And even if the evidence supporting such doubt is scant, the suspicion is difficult to explain away.

Simon dreams of one day hosting a colloquium of experts drawn from the world's best museums, who would work together on unlocking some of the statue's secrets. Perhaps they could come from London's British Museum or the Getty Museum in Los Angeles,

where Simon used to work. Or maybe from the Louvre in Paris, whose lab employs 180 people.

Simon's lab in Berlin, on the other hand, has 12. And the slow pace of the current work guarantees that, for the time being, the mysteries surrounding Nefertiti will remain just that.

For his part, Henri Stierlin says he can wait. "They know I'm right," he says.

**Please visit the site:**

<http://www.spiegel.de/international/zeitgeist/0,1518,625719,00.html>

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## **SHEDDING LIGHT ON THE CATACOMBS OF ROME, BY DUNCAN KENNEDY, BBC NEWS, ROME**

Rome's underground Christian, Jewish and pagan burial sites, the Catacombs, date back to the 2nd Century AD. There are more than 40 of them stretching over 170km (105 miles). But, until now, they have never been fully documented, their vast scale only recorded with handmade maps.

That is now changing, following a three-year project to create the first fully comprehensive three-dimensional image using laser scanners. A team of 10 Austrian and Italian archaeologists, architects and computer scientists have started with the largest catacomb, Saint Domitilla, just outside the Italian capital.

The tunnels, caves, galleries and burial chambers of Saint Domitilla stretch for about 15km (9 miles) over a number of levels. At a time when Christians, in particular, were persecuted, the Catacombs became a relatively safe place to bury the dead. The soft, volcanic tufa rock was an especially workable, yet durable, material that was burrowed out over the course of nearly three centuries. Yet, because of concerns about safety, only about 500m (1,640ft) are accessible to the public today.

### Scanner

The new, moving, images of this entire underground system will change all that and open up this beautiful subterranean world in a way that it has never been seen before.

The leader of the project, Dr Norbert Zimmerman of the Vienna Academy of Sciences, was behind the idea to use laser scanners to record every part of the Catacombs.

His scanner, which looks like a cylinder on a tripod, stands a metre or so high and is a piece of kit you usually find in the construction industry.

Gone are the days when archaeologists just used shovels, brushes and sieves to unearth the past.

The scanner has been placed in hundreds of different locations in the Catacombs.

It turns slowly, sending out millions of light pulses that bounce off every surface they come into contact with. The light pulses rebound back into the scanner and are recorded on a computer as a series of white dots, known as a "point cloud".

Gradually, every wall, ceiling, and floor is bombarded with the dots, enabling the computer to build up a picture of each room.

Eventually, the computer completes a 360-degree, three-dimensional, moving image of that room, with every surface looking like it is made up of small white dots.

At the same time a camera on the scanner takes a picture of each surface. That information is also fed into the computer enabling colour to be added to "fill in" the dots.

'Real data'

When the process is finished, it looks like an actual film of the particular room in question.

In all, four billion dots were recorded, enabling practically the whole catacomb to be documented in this way. Only a handful of small spaces were left out because it simply was not possible to get the scanner in.

The final result is astonishing.

On a computer screen, you can now see the whole underground complex.

Using different buttons on the key pad, you can zoom in on the tunnels.

You can travel "through" walls, down corridors and into chambers, giving the first real sense of its beauty, scale and detail.

Paintings on walls, which have not been seen in nearly 2,000 years, are now visible - their colours vivid and clear.

"It is not a virtual image, it is not animation - what you are seeing is real data," says Mr Zimmerman.

I ask him why he did not just video the whole thing.

"Well, you could have filmed each room. But that would not have given you the ability to 'travel' through the catacomb in a way that the scanned images allow," he says.

"Its moving, 3D flexibility, gives you the chance to compare areas, to assess the ways the Catacombs were developed over time, to analyse how and why those who built them did what they did," he adds. "That's never been possible before."

'Big job'

Mr Zimmerman and his team have nearly completed their work on the Saint Domitilla catacomb. It is now back to Vienna to study the images in more detail.

Dr Zimmerman says much of the work will be made available to the public. Examining the images from the Saint Domitilla catacomb alone will keep them busy for the next year or so. He has no plans to scan all the Catacombs.

"That is a big job, but it may well be needed if we are to really understand this incredible historical phenomenon and if we are to make a proper detailed study whilst these caves are still intact."

"We will publish our findings to reveal, for the first time, just how impressive these tombs were and how the people of that time went to so much effort to bury their dead," he says.

**Please visit the site:** <http://news.bbc.co.uk/2/hi/europe/8027650.stm>>: [Go there for pix and links to video].

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## **EGYPT FINDS 5,000-YEAR-OLD TOMB NEAR LAHUN PYRAMID, BY CYNTHIA JOHNSTON**

LAHUN, Egypt (Reuters) - Archaeologists have found a nearly 5,000-year-old tomb near Egypt's mud brick Lahun pyramid, in a sign that the site held religious significance a millennium before previously thought, the site head said Tuesday.

The find, down crumbling steps in sand covered desert rock, debunks a prior understanding by archaeologists that the site dates back only to 12th dynasty pharaoh Senusret II who ruled 4,000 years ago, archaeologist Abdul Rahman Al-Ayedi said.

"The existence of this tomb is very significant because now we know that Senusret II, the builder of the pyramid, is not the founder of this site," Ayedi told Reuters in an interview.

"It must have had religious significance in ancient Egypt, so that's why he chose it for his pyramid," he added.

Egypt, whose economy relies heavily on tourism, has made several significant discoveries this year including a rare intact mummy found in February in a sealed sarcophagus near the world's oldest standing step pyramid at Saqqara, near Cairo.

Ayedi said second dynasty tombs had never before been found at Lahun, site of Egypt's southernmost pyramid, or elsewhere around the nearby Fayoum oasis, 60 km (35 miles) south of Cairo.

Inside the tiny tomb, too small for a person to stand, a box-like wood coffin contains what is left of the remains of a 40 to 49-year-old man who was likely a significant figure in the ancient Egyptian government of the time, Ayedi said.

The body, buried in a bent position and wrapped in linens, was not well preserved because the tomb predates the era in which ancient Egyptians mummified their dead, Ayedi added.

"This was a very early example of a coffin ... The body was buried flexed. The lid of the coffin was vaulted and the side of the coffin has a representation of the facade of a palace or a house," he said.

### **LUCKY FIND**

The find comes shortly after Ayedi's team last month announced it had unearthed a cache of mummies dating to a later period in brightly painted coffins in a necropolis at the site - the first to be found in the shadow of the Lahun pyramid.

Ayedi said he had initially wanted to dig at little-known Lahun because he was not satisfied with the result of the first excavation there in the 19th century, saying it did not match the site's significance.



His team found the second dynasty tomb by chance this season while excavating the recently unearthed necropolis after Ayedi stumbled across a pottery shard in the sand that he recognized as dating back to an older era.

"I was just walking by and I found a (shard from a) pottery vessel like this one," Ayedi said as he held up a slender vessel inside the stone-cut tomb. "It was very characteristic."

"I was very optimistic to find something second dynasty," he added.  
"We started to investigate this area. Suddenly we found this stairway tomb."

Ayedi said the tomb's occupant was buried with his prized possessions, including an offering table, a headrest, two spears and a bed constructed of imported pine from Lebanon that could shed light on ancient Egyptian carpentry techniques.

Archaeologists found the main entrance to the Lahun pyramid last year, and later found storage jars and other objects inside before finding mummies in nearby tombs in recent months, Ayedi said.

Archaeologists hope to start digging soon in search of the tomb of Cleopatra and possibly her lover Mark Antony on Egypt's north coast.  
Cleopatra, facing possible captivity in Rome, is alleged to have killed herself by the sting of an asp in 30 BC.

(Writing by Cynthia Johnston)

**Please visit the site:**

<http://www.reuters.com/article/reutersEdge/idUSTRE54445920090505>

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## NEW MYCENAEAN FINDS FROM LACONIA

For those of you who don't read modern Greek: a rescue excavation around the church of Agios Vasileios near the modern village of Xirokambi (which is about 10-11 km south of Sparta) unearthed a wealth of Mycenaean finds, including figurines, wall-paintings, and three Linear B tablets. Two of the texts were surface finds, another was found in a dump. One records 500 daggers/swords, another textiles, and another without ideograms. The second tablet is page-shaped, which should attest to a fairly high level of administrative complexity.

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**Please visit the site:**

<http://www.ethnos.gr/article.asp?catid=11386&subid=2&tag=8400&pubid=3320805>

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## **THE NEXT AGE OF DISCOVERY, BY** **ALEXANDRA ALTER**

In a 21st-century version of the age of discovery, teams of computer scientists, conservationists and scholars are fanning out across the globe in a race to digitize crumbling literary treasures.

Some manuscripts are in poor condition, like this worm-eaten, 17th-century Christian Arabic Book of Hours from Balamand Monastery, Lebanon.

In the process, they're uncovering unexpected troves of new finds, including never-before-seen versions of the Christian Gospels, fragments of Greek poetry and commentaries on Aristotle. Improved technology is allowing researchers to scan ancient texts that were once unreadable -- blackened in fires or by chemical erosion, painted over or simply too fragile to unroll. Now, scholars are studying these works with X-ray fluorescence, multispectral imaging used by NASA to photograph Mars and CAT scans used by medical technicians.

A Benedictine monk from Minnesota is scouring libraries in Iraq, Syria, Lebanon, Turkey and Georgia for rare, ancient Christian manuscripts that are threatened by wars and black-market looters; so far, more than 16,500 of his finds have been digitized. This summer, a professor of computer science at the University of Kentucky plans to test 3-D X-ray scanning on two papyrus scrolls from Pompeii that were charred by volcanic ash in 79 A.D. Scholars have never before been able to read or even open the scrolls, which now sit in the French National Institute in Paris.

By taking high-resolution digital images in 14 different light wavelengths, ranging from infrared to ultraviolet, Oxford scholars are reading bits of papyrus that were discovered in 1898 in an ancient garbage dump in central Egypt. So far, researchers have digitized about 80% of the collection of 500,000 fragments, dating from the 2nd century B.C. to the 8th century A.D. The texts include fragments of unknown works by famous authors of antiquity, lost gospels and early Islamic manuscripts.

Among their latest findings: An alternate version of the Greek play Medea, later immortalized in a version by Euripides, on a darkened piece of papyrus, dated to the 2nd century A.D. In the newly discovered version -- written by Greek playwright Neophon -- Medea doesn't kill her children, says Dirk Obbink, director of Oxford's Oxyrhynchus Papyri Project.

War and political instability in artifact-rich regions such as Afghanistan and Iraq, where untold numbers of antiquities have been lost through looting and destruction, have ignited the push to digitize rare documents. Recent tragedies, such as the earthquake in L'Aquila, Italy, and the collapse this past March of the Cologne city archives in Germany, where conservationists are still working frantically to retrieve texts from the rain-soaked rubble, serve as reminders of how quickly cultural relics can be wiped out.

For as long as great manuscript collections have existed, their contents have been vulnerable. The ancient Library of Alexandria in Egypt burned down in 48 B.C.,

incinerating works by Aeschylus, Euripides and Sophocles; today, out of more than 120 plays by Sophocles, only seven survive.

While conservationists are quick to stress that pixels and bytes can never replace priceless physical artifacts, many see digitization as a vital tool for increasing public access to rare items, while at the same time creating a disaster-proof record and perhaps unearthing new information.

A digital arms race has been heating up in recent years as companies pour millions into large-scale digitization projects, including Microsoft's effort to scan 80,000 books at the British Library and IBM's multimillion-dollar project to create a virtual version of China's Forbidden City. The Ford Foundation and other organizations are funding a drive to translate and digitize some 700,000 manuscripts in Timbuktu, Mali. The world's oldest functioning monastery, St.

Catherine's in Egypt, is digitally photographing its collection of roughly 5,000 scrolls and manuscripts, including the Codex Sinaiticus, which dates to 330 A.D. and is thought to be the oldest Bible in the world.

Last month, the United Nations launched a "World Digital Library" with materials from 30 libraries and archives around the world, including the oracle bones, which hold the earliest Chinese writings, and an 8,000-year-old rock painting from South Africa. The project, which cost \$10 million in private donations, has images of 1,200 texts and artifacts and is expected to grow to house millions of items.

One of the most ambitious digital preservation projects is being led, fittingly, by a Benedictine monk. Father Columba Stewart, executive director of the Hill Museum and Manuscript Library at St. John's Abbey and University in Minnesota, cites his monastic order's long tradition of copying texts to ensure their survival as inspiration.

His mission: digitizing some 30,000 endangered manuscripts within the Eastern Christian traditions, a canon that includes liturgical texts, Biblical commentaries and historical accounts in half a dozen languages, including Arabic, Coptic and Syriac, the written form of Aramaic. Rev. Stewart has expanded the library's work to 23 sites, including collections in Syria, Lebanon and Turkey, up from two in 2003. He has overseen the digital preservation of some 16,500 manuscripts, some of which date to the 10th and 11th centuries. Some works photographed by the monastery have since turned up on the black market or eBay, he says.

Among the treasures that Rev. Stewart has digitally captured: a unique Syriac manuscript of a 12th-century account of the Crusades, written by Syrian Christian patriarch Michael the Great. The text, a composite of historical accounts and fables, was last studied in the 1890s by a French scholar who made an incomplete handwritten copy. Western scholars have never studied the complete original, which was locked in a church vault in Aleppo, Syria.

In February, Rev. Stewart traveled to Assyrian and Chaldean Christian communities in Kurdish villages in northern Iraq, where he hopes to soon begin work on collections in ancient monastic libraries. "You have these ancient Christian communities, there since the beginning of Christianity, which are evaporating," he says. He's now seeking access to manuscript collections in Iran and Georgia.

With his black monk's habit, trimmed gray beard and deferential manner, Rev. Stewart has been able to make inroads into closed communities that are often suspicious of Western scholars and fiercely protective of their texts. Armed with 23-megapixel cameras and scanning cradles, he sets up imaging labs on site in monasteries and churches, and trains local people to scan the manuscripts.

Once the labs are set up, the projects cost roughly \$20,000 a year in private donations. A similar effort to digitize Greek New Testament manuscripts by the Texas-based Center for the Study of New Testament Manuscripts costs roughly \$10,000 a week for staffing, travel and equipment.

Even as companies such as Google try to take digital archiving mainstream, uploading entire collections remains prohibitively expensive. Scanning books costs roughly 10 cents a page for regular books, and up to \$100 or even \$1,000 per book for rare manuscripts that require special handling and care.

Many conservationists are pessimistic about the prospect of putting entire library collections online within our lifetimes. The New York Public Library -- one of the library collections partnering with Google -- has digitally archived some 800,000 items, including 30,000 in the last nine months, but still has close to 50 million books and artifacts available only in print.

"In the current economic climate, the idea of really broad, deep digitization of a large scale is really off the table for the next couple of years," says Joshua Greenberg, director of digital strategy and scholarship for the New York Public Library. "It's a shame, because we're at the point where we really know how to do it."

An even more pressing concern for some scholars is that shoddy imaging work might damage manuscripts or fail to capture key details, such as binding styles, which give clues to a manuscript's date and origin.

Some experts say the push toward online archiving could ultimately hurt scholarly work by creating the illusion that everything is available online, when the digital record remains full of holes. In the age of instant information, physical artifacts seem increasingly at risk of being rendered obsolete.

"This could be our only chance," says Daniel Wallace, executive director of the Center for the Study of New Testament Manuscripts, the Texas-based center that is attempting to digitally photograph 2.6 million pages of Greek New Testament manuscripts scattered in monasteries and libraries around the world. The group has discovered 75 New Testament manuscripts, many with unique commentaries, that were unknown to scholars. Mr. Wallace says one of the rare, 10th century manuscripts they photographed was in a private collection and was later sold, page by page, for \$1,000 a piece. Others are simply disintegrating, eaten away by rats and worms, or rotting.

A cascade of groundbreaking discoveries in the past decade, unleashed by new technology, has stoked the sense of urgency. Multispectral imaging -- originally developed by NASA to capture satellite images through clouds -- has proved remarkably effective on everything from ancient papyrus scrolls to medieval manuscripts that were scraped off and written over when scribes recycled parchment pages. Using the technique, which captures high-resolution images in different light wavelengths, scholars

can see details invisible to the naked eye: For example, infrared light highlights ink containing carbon from crushed charcoal, while ultraviolet light picks up ink containing iron.

Researchers in Baltimore discovered a veritable library of ancient texts hidden in the pages of a single 13th-century Greek prayer book, including an unknown commentary on Aristotle and two missing treatises by the Greek mathematician Archimedes.

Recently, multispectral imaging has gotten much less expensive, allowing researchers to take their equipment into the field. The next frontier, researchers say, is using CAT scan and X-ray technology to read brittle scrolls without even unrolling them.

This summer, a new project to decode ancient manuscripts with multispectral imaging will begin at the University of Michigan, Berkeley, and Columbia. The project, led by scholars from Brigham Young, will scan 400 papyrus pieces. Among the specimens: papyrus fragments from rolls that were stuffed inside mummified Egyptian crocodiles in the 1st century B.C., which are thought to contain ancient legal documents, contracts and perhaps literary works. Their efforts could reveal text that scholars have been laboring to read for decades, including a partially obscured play by Euripides.

"It's being called a second Renaissance," says Todd Hickey, a curator of papyri at the University of California, Berkeley, which has some 26,000 pieces of papyrus, many still unread. "It's revealing things that we didn't have a hope of reading in the past."

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**Please visit the site: <http://online.wsj.com/article/SB124173896716198603.html>**

## **SCIENTISTS USE CHEMISTRY TO IDENTIFY HERBS IN EGYPTIAN MEDICINES, BY TOM AVRIL PHILADELPHIA INQUIRER**

PHILADELPHIA - Ancient Egypt was renowned for its prowess in the field of medicine, so much so that sick people went there from abroad in search of herbal remedies.

Archaeologists know that the herbs were administered in a potent blend with wine. But the identity of many of those medicinal additives is a mystery - their names recorded in hieroglyphics that have resisted modern efforts at translation.

Now, two University of Pennsylvania scientists have begun to crack the puzzle with chemistry.

In research published in April, the pair reported some of the earliest evidence of just what those long-ago physicians were prescribing.

One Egyptian clay jar, estimated to be more than 5,000 years old, yielded flaky residue that suggests a veritable apothecary of possible ingredients: coriander, senna, germander, balm, and savory, among others. Samples scraped from the inside of a newer jar, just 1,500 years old, yielded compounds that likely came from rosemary.

The research, done in collaboration with a chemist from the U.S. Treasury Department, is more than a quest for history. Senior author Patrick McGovern, an "archaeochemist" at Penn's Museum of Archaeology and Anthropology, wants to know if the ancient herbalists came up with anything that really works.

Researchers at Penn's Abramson Cancer Center are similarly intrigued, and already are studying herbs identified in some of Mr. McGovern's previous experiments. A derivative of the wormwood plant, found in a 3,200-year-old fermented beverage from China, has shown some promise against tumor cells in preliminary lab studies.

"I think people should be open-minded" about ancient remedies, said Wafik S. El-Deiry, a Penn professor of medicine, genetics, and pharmacology, "because there may be hidden treasures."

The Egyptians and Chinese of old weren't trying to use their herbs against cancer, as far as Mr. McGovern knows. But some of their medicines are used today for the same purposes as long ago.

One such example is fennel, to combat indigestion, said Lise Manniche, an assistant professor of Egyptology at the University of Copenhagen. The Penn study found no evidence of fennel, but it is among those plants whose names have been translated from the ancient texts.

Ms. Manniche said the new evidence, published in the online edition of Proceedings of the National Academy of Sciences, represented an ideal marriage of chemistry and archaeology.

"It's absolutely fascinating that such a small amount [of residue] can give us so much information," said Ms. Manniche, who was not involved with the study.

Both clay jars came from Egyptian tombs. The 1,500-year-old vessel is owned by the Royal Ontario Museum in Toronto; the one that dated back five millennia was excavated by German archaeologists from the tomb of ruler Scorpion I.

In both cases, the wine residue was scraped from the jars and simply sent to Mr. McGovern by mail.

The chemist can't say exactly which herbs were used in the wine. The analysis of the older jar revealed only that the residue contained certain "terpenoid compounds" - the presence of which could be explained by one or more herbs.

It is also unclear which diseases they might have been used for.

Egyptian physicians recorded diseases and their treatments in hieroglyphics on papyrus documents that have survived to this day. But with many of the remedies, modern scholars know only that they consisted of some sort of plant - signified by a picture of a leaf at the end of the name, Ms. Manniche said.

Mr. McGovern's co-authors were Penn research associate Gretchen Hall and Armen Mirzoian, a senior chemist at the Treasury Department's Alcohol and Tobacco Tax and Trade Bureau. In addition to looking at ancient herbs for their medicinal value, Mr. McGovern has studied them for their taste.

He has shared his findings with Dogfish Head brewery in Delaware, working with it to reproduce certain beverages of old. One of the biggest hits with customers has been Midas Touch, a mixture of grape wine, barley beer, and honey mead. The recipe is based on analysis of vessels from the reputed tomb of King Midas, ruler of the Phrygians.

Though the evidence from Midas and from the Egyptians comes from tombs, Ms. Manniche and Mr. McGovern said it's pretty clear that these beverages were consumed by the living.

"What was good in life was definitely good in death," Mr. McGovern said.

And, he hopes, good for life thousands of years later.

**Please visit the site:**

<http://www.toledoblade.com/apps/pbcs.dll/article?AID=/20090504/ART16/905040309>

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## **RARE STATUE OF MARBLE DISCOVERED IN ALEXANDRIA**

The Secretary General of the Supreme Council of Antiquities (SCA) Zahi Hawwas said 9/5/2009 that a Greek archeological mission under Calliope Papacosta discovered a rare statue made of white marble in Alexandria.

The 80 cm long, 23 cm wide statue has been discovered eight meters deep under the earth surface, Hawwas said.

A ribbon around the head of the statue proves that it belongs to an important person for such ribbon was used only by rulers, Hawwas added.

The facial features of the statue are much similar to that of Alexander the Great especially the nose and hair style, he said

**Please visit the site:**

<http://www.sis.gov.eg/En/EgyptOnline/Culture/000002/020300000000000001144.htm> [Go there for small image.]

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## **NEW FINDS SPAN TIME, NEVINE EL-AREF REPORTS**

At the Shallalat Gardens next to the fortress of Mohamed Ali in Alexandria, a Greek archaeological mission has discovered what is thought may be a statue of Alexander the Great. The statue, of white marble, features an athletic man standing in an upright position. The right leg bent and the part of the left leg below the knee is missing. A 0.16m length of the right arm exists and it has a connection notch, while the left arm is completely missing. Inside the shoulder is a metallic connection. The phallus is broken but the testes are preserved.

Kalliopi Limneou-Popakosta, director of the mission, said that the face was in very good condition except for some slight damage to the nose. The head is of the "heroic" type, with the characteristic turn of the neck and an upward glance of the eyes. The face is handled in the soft Praxitelian manner. The statue has curly hair with a ribbon, and there are sideburns on the cheeks. The body is slightly turned to the right in a "contraposto" style, and once possibly leant on a base, traces of which can be seen under the right buttock.

"This is one of the most important discoveries in the Shallalat Gardens in 100 years," Zahi Hawass, secretary-general of the Supreme Council of Antiquities (SCA), told Al-Ahram Weekly. He added that the discovery would probably lead to a very significant result concerning this area in the core of Alexandria, which was the site of the throne, the garden area of the royal palace, and the old Alexandria library during the Graeco-Roman era. "Remains of Alexandria's old royal quarter have been also found," Hawass said.

Last year a team working with the Graeco Roman Museum in Alexandria unearthed the base of a statue of Ptolemy V carved by the royal guards to glorify him, as well as a number of statues featuring Bacchus, the wine god.

Ahmed Abdel-Fatah, an expert in the antiquities of the Graeco-Roman period, said that the features of the statue were similar to those of Alexander the Great, especially the hair and the nose.

In the area in front of Al-Karn Al-Zahabi (Golden Horn) Island, north of Qarun Lake, an Egyptian mission from the SCA has unearthed an enormous collection of prehistoric objects revealing the skills of the prehistoric people who lived in the area.

The collection is composed of hunting and medicine tools. Needles, necklaces, earrings and bracelets made of animal bones have been unearthed, along with a number of primitive stone dwellings and shelters.

Hawass said that early investigations on the objects discovered revealed that the site was not only used in prehistoric time but continued to be inhabited through the different spans of history up to and including the Islamic era. From ancient Egyptian times, he said, the mission had unearthed a limestone relief bearing the cartouche of the Scorpion king of dynasty zero and a coloured bracelet made of glass. From the Graeco-Roman period the mission found a collection of coins, while fragments of coloured and

decorated plates stamped with the name of the Fatimid king Al-Zafer are from the Islamic period.

Khaled Saad, head of the mission and director of the prehistory administration department, said the mission had also found several kinds of needles, showing that there were several methods of weaving leather in prehistoric time. The mission also found a skeleton of a primitive whale similar to those found in Wadi Al-Hitan in Fayoum, as well as skeletons of sawfish, crocodiles, turtles and sharks' teeth.

Jewellery made of semi-precious stones and bones have been also unearthed as well as arrows, knives and grindstones from the prehistoric era, dated about 7100 BC.

Twenty-five rock-hewn tombs have been located on the sides of a nearby hill, Saad says, as well as a great number of human bones. A seven-metre deep shaft has also been found on the hill. Inside it were two chambers filled with sand and contained a complete human skeleton.

Please visit the site: <http://weekly.ahram.org.eg/2009/948/he2.htm>

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## **A HISTORIC GRAVE FOUND IN İZMİR** **BY ACCIDENT**

İZMİR - A king's grave was uncovered during construction in İzmir's Kemalpaşa district. The area has been taken under protection and İzmir Museum Directorship officers have started an inspection of the grave and its contents.

The king's grave was found in a 211-square-meter area owned by Behçet Aktaş in Kemalpaşa's Atatürk neighborhood. It was discovered when a construction digger struck a rock that was part of the grave during excavation work for a newly-planned building.

The landlord of the building next to the excavated area, İlker Yıldız, said they saw an empty space inside the rock, which contained ancient pieces. "After we saw the pieces we understood that the area being dug contained historic pieces and we called the gendarmerie. They stood on guard for a day until the İzmir Museum Directorship's officers and experts arrived," Yıldız said. He also said they collected the unearthed pieces but that the grave was still there because part of the land containing the grave was under a building and if they were to dig more the building could collapse.

The area is now protected with wires and the uncovered pieces are being cleaned and will be studied to discover the king's identity.

**Please visit the site:**

**<http://www.hurriyet.com.tr/english/domestic/11628133.asp?scr=1>**

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## **RACE TO PRESERVE THE WORLD'S OLDEST SUBMERGED TOWN**

(PhysOrg.com) -- The oldest submerged town in the world is about to give up its secrets — with the help of equipment that could revolutionise underwater archaeology.

The ancient town of Pavlopetri lies in three to four metres of water just off the coast of southern Laconia in Greece. The ruins date from at least 2800 BC through to intact buildings, courtyards, streets, chamber tombs and some thirty-seven cist graves which are thought to belong to the Mycenaean period (c.1680-1180 BC). This Bronze Age phase of Greece provides the historical setting for much Ancient Greek literature and myth, including Homer's Age of Heroes.

Underwater archaeologist Dr Jon Henderson, from The University of Nottingham, will be the first archaeologist to have official access to the site in 40 years. Despite its potential international importance no work has been carried out at the site since it was first mapped in 1968 and Dr Henderson has had to get special permission from the Greek government to examine the submerged town.

Although Mycenaean power was largely based on their control of the sea, little is known about the workings of the harbour towns of the period as archaeology to date has focused on the better known inland palaces and citadels. Pavlopetri was presumably once a thriving harbour town where the inhabitants conducted local and long distance trade throughout the Mediterranean — its sandy and well-protected bay would have been ideal for beaching Bronze Age ships. As such the site offers major new insights into the workings of Mycenaean society.

The aim of Dr Henderson's project is to discover the history and development of Pavlopetri, find out when it was occupied, what it was used for and through a systematic study of the geomorphology of the area establish why the town disappeared under the sea.

Dr Henderson, from the Underwater Archaeology Research Centre (UARC) in the Department of Archaeology, said: “This site is of rare international archaeological importance. It is imperative that the fragile remains of this town are accurately recorded and preserved before they are lost forever. A fundamental aim of the project is to raise awareness of the importance of the site and ensure that it is ethically managed and presented to the public in a way which is sustainable and of benefit to both the development of tourism and the local community.”

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The submerged buildings, courtyards, streets, tombs and graves, lie just off a sandy stretch of beach close to an area popular with holiday makers and campers. Under threat from tourism and industry the remains are being damaged by boats dragging their anchors, inquisitive snorkelers on the hunt for souvenirs and the growth of marine organisms which are also taking their toll degrading the fragile 3,500 year old walls.

The survey, in collaboration with Mr Elias Spondylis of the Ephorate of Underwater Antiquities of the Hellenic Ministry of Culture, will be carried out using equipment originally developed for the military and offshore oilfield market but looks set to transform underwater archaeological survey and recording.

Dr Henderson and his team will carry out a detailed millimeter accurate digital underwater survey of the site using an acoustic scanner developed by a major North American offshore engineering company. The equipment can produce photo-realistic, three dimensional digital surveys of seabed features and underwater structures to sub-millimetre accuracy in a matter of minutes.

Dr Henderson said: “The ability to survey submerged structures, from shipwrecks to sunken cities, quickly, accurately and more importantly, cost effectively, is a major obstacle to the future development of underwater archaeology. I believe we now have a technique which effectively solves this problem.”

Joining the team will be Dr Nicholas Flemming who discovered the site in 1967. The following year he led a team from the University of Cambridge who surveyed the area with hand tapes. The archaeological material — pottery, figurines, obsidian and small finds — they collected belong to the Early Helladic, Middle Helladic and Late Helladic period (c. 2800-1180 BC). A systematic assessment of the finds recovered at the time is currently being undertaken by Dr Chrysanthi Gallou at The University of Nottingham.

The project has received funding from the Institute of Aegean Prehistory (INSTAP), The University of Nottingham and the British School of Archaeology at Athens but it is still £10,000 short of the amount needed to carry out the main archaeological survey.

Four annual fieldwork seasons are planned. This May and June the team will carry out a full underwater survey. Between 2010 and 2012 there will be three seasons of underwater excavations. After a study season in 2013 the findings of Dr Henderson's research will be published in 2014.

Provided by University of Nottingham (news : web)

**Please visit the site: <http://www.physorg.com/news161274284.html>**

## **PREHISTORIC FISHING TACKLE** **FOUND IN EGYPT**

CAIRO - An Egyptian archaeological team has found prehistoric fishing gear, sewing equipment and jewellery all made from animal bones, as well as pottery and coins, near an oasis south of Cairo, officials said on Tuesday.

Culture Minister Faruk Hosni said in a statement: “An Egyptian archaeological mission working near El-Karn island on Lake Qarun in Fayoum has found a large amount of fishing tackle, sewing equipment and jewellery made from animal bone dating back to prehistoric time.”

“The mission also found caves used by prehistoric man,” he said.

“The most important item is an awl made of animal bone and granite, which shows that prehistoric man devised many ways to sew leather,” Khaled Saad, who headed the mission, was quoted as saying.

The team also found ancient pottery, coins, whale vertebrae and fossils of seals, sawfish as well as crocodile and turtle parts, Saad said.

Medical equipment and weapons made of animal bone were also unearthed, he said.

The site was used by many civilisations, antiquities chief Zahi Hawass was quoted as saying in the statement.

“During excavation, the mission found antiquities from the Pharaonic, Greek, Roman and Islamic periods,” Hawass said.

The team also found a rare block which dates back to 3150 BC depicting the mythical leader known as the Scorpion King, as well as colourful mosaic plates with engravings of the Fatimid caliph Al-Zafir.

**Please visit the site:**

**[http://www.khaleejtimes.com/DisplayArticle08.asp?xfile=data/international/2009/May/international\\_May855.xml&section=international](http://www.khaleejtimes.com/DisplayArticle08.asp?xfile=data/international/2009/May/international_May855.xml&section=international)**

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## **FULL-FIGURED STATUETTE, 35,000 YEARS OLD, PROVIDES NEW CLUES TO HOW ART EVOLVED BY JOHN NOBLE WILFORD**

No one would mistake the Stone Age ivory carving for a Venus de Milo. The voluptuous woman depicted is, to say the least, earthier, with huge, projecting breasts and sexually explicit genitals.

Nicholas J. Conard, an archaeologist at the University of Tübingen, in Germany, who found the small carving in a cave last year, said it was at least 35,000 years old, “one of the oldest known examples of figurative art” in the world. It is about 5,000 years older than some other so-called Venus artifacts made by early populations of Homo sapiens in Europe.

Another archaeologist, Paul Mellars of the University of Cambridge, in England, agreed and went on to remark on the obvious. By modern standards, he said, the figurine’s blatant sexuality “could be seen as bordering on the pornographic.”

The tiny statuette was uncovered in September in a cave in southwestern Germany, near Ulm and the Danube headwaters. Dr. Conard’s report on the find is being published Thursday in the journal Nature.

The discovery, Dr. Conard wrote, “radically changes our view of the origins of Paleolithic art.” Before this, he noted, female imagery was unknown, most carvings and cave drawings being of mammoths, horses and other animals.

Scholars say the figurine is roughly contemporaneous with other early expressions of artistic creativity, like drawings on cave walls in southeastern France and northern Italy. The inspiration and symbolism behind the rather sudden flowering have long been debated by art historians.

Commenting in the journal on the discovery, Dr. Mellars, who did not take part in the research, wrote that the artifact was one of 25 similar carvings found over the past 70 years in other caves in the Swabian region of southern Germany, “a veritable art gallery of early ‘modern’ human art.”

These sites, he concluded, “must be seen as the birthplace of true sculpture in the European — maybe global — artistic tradition.”

Scholars say the large caves were presumably inviting sanctuaries for populations of modern humans migrating then into Central and Western Europe. These were the people who eventually displaced the resident Neanderthals, around 30,000 years ago.

Dr. Conard reported that the discovery was made beneath three feet of red-brown sediment in the floor of the Hohle Fels Cave. Six fragments of the carved ivory,

including all but the left arm and shoulder, were recovered. When he brushed dirt off the torso, he said, “the importance of the discovery became apparent.”

The short, squat torso is dominated by oversize breasts and broad buttocks. The split between the two halves of the buttocks is deep and continuous without interruption to the front of the figurine. A greatly enlarged vulva emphasizes the “deliberate exaggeration” of the figurine’s sexual characteristics, Dr. Conard said.

The object reminded experts of the most famous of the sexually explicit figurines from the Stone Age, the Venus of Willendorf, discovered in Austria a century ago. That Venus is somewhat larger and dated about 24,000 years ago, but it is in a style that appeared to have been prevalent for several thousand years. Scholars speculate that these Venus figurines, as they are known, were associated with fertility beliefs or shamanistic rituals.

The Hohle Fels artifact, less than 2.5 inches long and weighing little more than an ounce, is headless. Carved at the top, instead, is a ring, evidently to allow the object to be suspended from a string or thong.

**Please visit the site:**

[http://www.nytimes.com/2009/05/14/science/14venus.html?\\_r=1&hpw](http://www.nytimes.com/2009/05/14/science/14venus.html?_r=1&hpw) [Go there for pict.]

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## **EMPEROR TRAJAN'S PALACE** **DISCOVERED IN SOUTHWESTERN** **ROMANIA**

BUCHAREST, May 14 (Xinhua) -- Romanian archaeologists has discovered, in southeastern county of Caras-Severin, a complex structure estimated to be 2,000 years old belonging to the Roman culture, local media reported on Thursday.

The archaeological discovery has a special importance because it was built very early, probably in the autumn of 101 during the first Dacian-Roman War of 101-102, before the actual Roman conquest of Dacia, the Carpathian-Danube region, modern day Romania.

The discovery will bring the village of Zavoi in Caras-Severin County to the attention of history researchers and archaeologists from around the world following the digging up of the ruins of a Roman palace with well-preserved structures, which is expected to offer so far unknown precious information about the Daco-Roman culture, according to the official Agerpres news agency.

The archaeological style of the building is unique in Romania, as it fully meets the Roman tradition for towering structures, according to local experts.

The Roman vestiges of Zavoi will be recovered, conserved and displayed to their real value with support from the local and central government and is expected to bring about the tourist development of the entire area.

The salvaging diggings so far will become systematic, and the entire location will turn into an archaeological site, according to the archaeological team headed by researcher Adrian Ardet of the Caransebes County Museum of Ethnography.

**Please visit the site:**

**[http://news.xinhuanet.com/english/2009-05/15/content\\_11376185.htm](http://news.xinhuanet.com/english/2009-05/15/content_11376185.htm)**

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## **UNCOVERING ONE OF BIGGEST SECRETS OF KHUFU PYRAMID**

July 26 will mark the uncovering of one of the biggest secrets of the Great Pyramid of Khufu in Giza, Secretary General of the Egyptian Supreme Council of Antiquities Zahi Hawwas said Saturday 16/5/2009.

Addressing a symposium held within the framework of the Turin International Book Fair, he said the SCA will undertake another experiment involving getting a robot made by a group of scientists at the Universities of Hong Kong and Manchester into the pyramid to uncover the mystery shrouding the third gate of one of the pyramid's corridors. This gate is expected to lead to the room where King Khufu is buried.

The Great Pyramid of Giza (Pyramid of Cheops) is the oldest and largest of the three Giza pyramids and is the only remaining member of the Seven Wonders of the Ancient World.

It is believed the pyramid was built as a tomb for Fourth dynasty Egyptian King Khufu (Cheops in Greek) and constructed over a 20 year period concluding around 2560 BC.

The Great Pyramid was the tallest man-made structure in the world for over 3,800 years. Originally the Great Pyramid was covered by casing stones that formed a smooth outer surface, and what is seen today is the underlying core structure. Some of the casing stones that once covered the structure can still be seen around the base.

There have been varying scientific and alternative theories regarding the Great Pyramid's construction techniques. Most accepted construction theories are based on the idea that it was built by moving huge stones from a quarry and dragging and lifting them into place.

There are three known chambers inside the Great Pyramid. The lowest chamber is cut into the bedrock upon which the pyramid was built and was unfinished. The so-called Queen's Chamber and King's Chamber are higher up within the pyramid structure.

The Great Pyramid of Giza is the main part of a complex setting of buildings that included two mortuary temples in honor of Khufu; one close to the pyramid and one near the Nile.

**Please visit the site:**

<http://www.sis.gov.eg/En/EgyptOnline/Culture/000002/02030000000000000001151.htm>

# **BIOMEDICAL OPTICS & MEDICAL IMAGING, COMPUTED TOMOGRAPHY SCANNING OF MERESAMUN EMILY TEETER AND MICHAEL VANNIER**

Very detailed 3D scans of a 3000-year-old mummy of an Egyptian temple singer and priestess are made freely available for in-depth follow-up studies.

18 May 2009, SPIE Newsroom. DOI: 10.1117/2.1200904.1627

We recently obtained two sets of computed tomography (CT) scans of the Meresamun mummy, which had been present at the Oriental Institute since the 1920s but was never opened. In July 2008, we decided to obtain an up-to-date CT scan, in anticipation of a new exhibit featuring Meresamun. The mummy had been scanned at the University of Chicago in 1991 with a single-slice CT scanner, so it was not clear what kind of ‘new’ information, if any, could be extracted. On the basis of an extensive review of the literature on mummy-CT scanning, we are aware of only one paper in which a multidetector row-CT scanner featuring more than 16 channels was used, and then only to examine the mummy's head.<sup>1</sup>

We used a 64-channel Philips Brilliance 64 clinical scanner to acquire a set of spiral-CT scans after the mummy had been crated and transported to the University of Chicago Medical Center's radiology department. All mummy handling was performed by museum staff, supervised by curators and conservators. The mummy's casket was carefully placed on the scanner table. Both full-body and local scans were obtained, the latter of the head and shoulders, torso, lower extremities, and feet. Each of these data sets was post-processed using a Philips Brilliance version 3 workstation to generate multiplanar reconstructions (MPRs) and 3D images. The data was archived on CDs and DVDs, and analyzed using an Apple MacBook running the Osirix open-source operating system.

Based on our experience with the 64-slice scanner, approximately 5000 slices were created, which were used to generate 1000 reconstruction images and sequences. Inspection of the results revealed many previously unrecognized details, including subtle post-mortem fractures of the upper skeleton, dental features, jewelry, radiodense inclusions in the casket, and degenerative changes in the spine.

In September 2008, a 256-slice CT scanner was installed in the radiology department. The newly constructed room required inspection by the Illinois Department of Public Health for conformance to safety standards. In the meantime, the mummy was crated and returned to the radiology department for a second set of scans and became the first ‘patient’ to be examined with the new scanner (see Figure 1). We acquired seven data sets of the head and neck, torso, whole casket, lower extremities, and feet. The raw projection data sets were saved (~30Gb), together with approximately 25,000 reconstruction axial images. Subsequently, we repeatedly reconstructed the raw projection data by varying the relevant parameters (e.g., center, magnification, filters, thickness, and matrix size), thus yielding about 100,000 axial slices.

Using a Philips Brilliance 4.0 workstation (a major upgrade and better suited to the very large data sets acquired with the 256-slice scanner), we generated MPRs and 3D views (see Figure 2), and made numerous movie sequences. Post-processing has yielded edited files of the disarticulated skeleton, local and regional organ studies, overlays, and solid models. We also generated stereolithography files to enable life-size modeling. The results of the 256-slice CT scans far exceeded our expectations, and to date this mummy may have been studied more exhaustively with CT than any other (see Figure 3).

Although numerous books, journal articles, reports, and news articles discuss CT scanning of mummies, no comparable examination exists in terms of the details found, number of images generated, technical specifications of the imaging system, and computer-graphics results (see Figure 4).

The announcement of the new Meresamun exhibit excited significant media interest and resulted in numerous news reports (e.g., on CNN), magazine articles (most notably in *Archaeology*,<sup>2</sup> which also created a dedicated website), and many other outlets. A special monograph, authored by numerous experts and edited by world-leading authorities in Egyptology, was developed to complement and catalog the exhibit.<sup>3</sup>

There are several unusual aspects to this study. Most important, all experts who worked on this project agreed to freely share all data obtained, which will be made available online (see Figure 5). To those who do not have access to a 256-channel CT scanner and unopened mummy in a casket, this therefore offers a unique opportunity to continue and expand our studies.

Emily Teeter  
Oriental Institute  
University of Chicago  
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Emily Teeter is an Egyptologist and research associate, as well as vice-president of the American Research Center in Egypt. She has authored numerous books and scholarly publications.

Michael Vannier  
Department of Radiology  
University of Chicago Medical Center  
Chicago, IL

Michael Vannier is professor of radiology and a pioneer in 3D biomedical computer graphics and visualization. He is editor in chief of the *International Journal of Computer Assisted Radiology and Surgery*. He is a fellow of both the American College of Radiology and the American Institute of Medical and Biological Engineering.

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**Please visit the site:**

<http://spie.org/x35066.xml?highlight=x2416&ArticleID=x35066> [Go there for good pix.]

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## **ANCIENT CLAY HAS INTERNAL CLOCK**

A new way of dating archaeological objects has been found, using water to unlock their "internal clocks".

Fired clay ceramics start to react chemically with atmospheric moisture as soon as it is removed from the kiln.

Researchers believe they can pinpoint the precise age of materials like brick, tile and pottery by calculating how much its weight has changed.

The team from Edinburgh and Manchester universities hope the method will prove as significant as radiocarbon dating.

Edinburgh University's Christopher Hall explained: "Almost every archaeological site has old bits of old pot but there's no good method to date it."

Radiocarbon dating, used for bone or wood, cannot be used for ceramic material because it does not contain carbon.

Their new rehydroxylation dating method, reported in Proceedings of the Royal Society A, measures the amount of water the material has "recombined with".

Professor Hall, who described the advance as "very exciting", said it would plug a "yawning gap in the dating methods for ceramics".

He and his team, from the universities of Edinburgh and Manchester and the Museum of London, were able to date brick samples from Roman, medieval and modern periods with remarkable accuracy.

They have established that their technique can be used to determine the age of objects up to 2,000 years old but believe it has the potential to be used to date samples around 10,000 years old.

Researchers are now planning to look at whether the new dating technique can be applied to earthenware, bone china and porcelain.

"The recombination goes on for several thousands of years," said Professor Hall.

"And what's strange about it is that it abides by a precise physical law.

"If we can work out how much moisture has been taken up, we can estimate the age of the sample."

### **Extreme heat**



Dr Moira Wilson from Manchester University led the research. She said the technique could also be "turned on its head and used to establish the mean temperature of a material over its lifetime".

"If a precise date of firing were known, this could potentially be useful in climate change studies."

The technique involves measuring the mass of a sample and then heating it to around 500C in a furnace. This removes the water that has combined with it over its lifetime.

The sample is then weighed in a "super-accurate" device, known as a microbalance, to determine the precise rate at which the material will combine with water over time.

Using the time law, it is possible to extrapolate the data to calculate the time it will take to regain the mass lost on heating - revealing the sample's age.

The researchers applied this technique to a range of brick and tile samples.

They have calculated that a Roman brick sample with a known age of about 2,000 years was 2,001 years old. A further sample with a known age of between 708 and 758 years was calculated to have an age of 748 years.

The researchers also tested a 'mystery brick', with the real age only revealed to them once they had completed their process. The known age was between 339 and 344 years - and the new technique suggested the brick was 340 years old.

The team also found that ceramic objects have their internal date clocks reset if they are exposed to temperatures of 500C.

### **Bombing raids**

Used on medieval brick from Canterbury, the technique repeatedly dated the sample as being 66 years old.

Further investigation revealed that Canterbury was devastated by incendiary bombs and fires during World War II bombing raids in 1942.

The intense heat generated by the bombing had reset the dating clock by, in effect, re-firing the bricks.

The results also proved accurate enough to show that a brick sample from the King Charles building in Greenwich came from reconstruction carried out in the 1690s, and not from the original building which was constructed between 1664 and 1649.

Professor Hall said: "This new technique could allow us to discover a great deal about ancient artefacts by pinpointing their age and, as we have shown in our experiments, it is also useful in determining the age of modern materials.

"We believe the method will become standard practice."

While he pointed out that its accuracy would need to be validated many times, he added that it is much cheaper and simpler than current available methods.

The most widely-used technique, thermoluminescence, requires a lot of information about the archaeological site, he said.

"This cannot be applied to objects which have been removed from the site to a museum. Our method does not have this problem."

**Please visit the site:**

[http://news.bbc.co.uk/2/hi/uk\\_news/scotland/edinburgh\\_and\\_east/8058185.stm](http://news.bbc.co.uk/2/hi/uk_news/scotland/edinburgh_and_east/8058185.stm)

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## **U.S. AND POLISH ARCHAEOLOGISTS SUCCESSFUL AT BERENIKE**

Fragments of pottery with inscriptions in one of pre-Islamic languages have been found by a U.S-Polish team of archaeologists near Berenike, a Greco-Roman harbour on the Egyptian Red Sea coast. The finds confirm that Berenike was the most active Red Sea port during Hellenistic and Roman times. Inscriptions and other written materials found in Berenike have been written in 12 different languages. This attests to the cosmopolitan mix of people who lived in or passed through the town.

Berenike was founded by Ptolemy II Philadelphus in 285-246 B.C.

The international team of archaeologists led by professor Steven Sidebotham of the University of Delaware and Iwona Zych of the Warsaw University Mediterranean Archaeology Department have resumed excavation at Berenike after an eight-year break.  
AT

**Please visit the site:**

**[http://en.naukawpolsce.pl/palio/html.run? Instance=cms\\_naukapl.pap.pl& PageID=1&s=szablon.depesza&dz=archeology&dep=361511&data=&lang=EN& CheckSum=2050323395](http://en.naukawpolsce.pl/palio/html.run? Instance=cms_naukapl.pap.pl& PageID=1&s=szablon.depesza&dz=archeology&dep=361511&data=&lang=EN& CheckSum=2050323395)**

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## **THE JERUSALEM POST ONLINE** **EDITION, AROUND ISRAEL, ISRAEL'S** **ATLANTIS, BY WENDY BLUMFIELD**

The bay of Atlit, about 10 kilometers south of Haifa, is a quiet, picturesque stretch of beach. Sheltered by the promontory and the Crusader castle, the inlet looks as if it were scooped out with an ice-cream server. Between the unpaved road leading to the bay and the beach, wildflowers were already blooming on the cold windy day Metro investigated the mystery under that sea.

Dr. Ehud Galili, a marine archeologist with the Israel Antiquities Authority, lives in Atlit and is passionate about this small town that is unfamiliar to most Israelis. Born in Haifa, Galili has been enraptured by the sea from childhood. A fourth-generation sabra, his grandmother's parents came from a fishing family who lived at the Kinneret. He actively campaigns against the encroachment of marinas and the high-rising construction that threatens the beauty of the ridges on this historic coastline. Galili's findings over the past 25 years have made him even more determined to preserve the area as a heritage site.

Galili details the various historic eras of the artifacts and human remains along this stretch of coast. At Kfar Samir and Kfar Galim, between Atlit and Haifa, the earliest-known evidence of olive oil was found - dating from the Late Neolithic era, some 7,500 years ago. A Phoenician harbor and the battering ram from a Hellenistic Greek warship were discovered just north of the Crusader castle.

But in 1984, during an underwater archeological survey, Galili and his colleagues discovered the Atlit-Yam village - some 400 meters offshore. The submerged village, he says, is the largest and best-preserved prehistoric settlement ever uncovered off the Mediterranean coast. In an area of 40,000 square meters eight to 12 meters below sea level, the archeologists found remains of human habitation dating back 9,000 years to the late Pre-Pottery Neolithic period.

Putting together the jigsaw puzzle of their findings, the architecture of the dwellings and the radiocarbon dating sets the scene for what is thought to have been the earliest-known agro-pastoral fishing community, a claim that has gone undisputed by archeological authorities. Marine discoveries from the site are published in professional journals worldwide.

THE ATLIT site is the only one in the world to have uncovered such a complete submerged village, and is also the only one known to contain undisturbed burials. The inhabitants were buried, placed in a flexed position on their sides or backs, sometimes in group graves. This appears to have been a common practice of that time, although the reason is not known. Perhaps the positioning indicates a return to the fetal position. Evidence of rituals suggesting ancestor worship, such as burying the dead close to or within the dwellings, has also been found. The burial sites also contained offerings to the dead, such as an axe for a male and a grinding-stone for a female. Floral and faunal remains suggest that the village sustained itself on hunting, herding, farming and fishing.

Evidence of maritime activity, domestication of animals and plants, and the use of the water tables on the stone-built wells show a sophisticated level of civilization.

The condition of the human remains shows that although health was generally poor, many male inhabitants had lived to beyond 50, relatively long compared to other Neolithic communities. The average heights of the village's inhabitants, based on skeletons, were 144 cm.

for women and 164 cm. for males. Many skeletons showed evidence of dental disease and a condition associated with using the teeth in making fishnets, as well as vertebrae disorders, elbow abrasion and specific muscle markings typical of boat rowers. Galili and Prof.

Israel Herskovitz, senior lecturer in Physical Anthropology at Tel Aviv University Medical School, discovered anomalies in the ears of some of the skeletons which indicated that the villagers dove for fish.

Galili is convinced that 9,000 years ago, Atlit-Yam was a thriving maritime community in a location rich in resources - fish, barley, lentils and wheat grown on the fertile drained swampland and freshwater springs. The inhabitants of Atlit-Yam appear to have had a healthy diet of meat, fish, legumes and grains, as well as fruit. In addition, the distance between the remains of domesticated animals (with a high percentage of pigs and goats) from those of wild ones suggests that farming methods at that time included raising animals.

Evidence of pollen from olive trees has also been found, but the lack of pits at Atlit-Yam indicates that it took another millennium before olives were pressed for oil - whereas exploration at the later Neolithic Period at Neveh Yam, just round the bay from Atlit-Yam, as well as at Kfar Samir, Kfar Galim and Megadim on the coast south of Haifa, has revealed thousands of olive pits and evidence of waste from olive-oil production.

Recently, researchers identified signs of tuberculosis in the skeletons of a mother and child at the site. *Mycobacterium tuberculosis*, the principal agent of human TB, is believed to have evolved over the millennia. A multi-disciplinary team from Tel Aviv and the Hebrew Universities in Israel and Centers for Infectious Diseases in the UK together with the Israel Antiquities Authority put together the tests, including DNA. TB was generally held to have been transferred to humans from cattle, but there were no cows at Atlit-Yam. This led to the suggestion that the high density of the fishing village's population had facilitated the transmission of the disease. According to Dr. Helen Donoghue, the infected organism is "definitely the human strain of TB, in contrast to the original theory that human TB only evolved from bovine TB later on in history, after the domestication of animals."

Dr. Simon Mays, a skeletal biologist at the English Heritage Center for Archaeology, says that the Atlit TB findings "predate the discovery of the only other convincing case of TB from Italy by about 6,000 years."

"There are many lessons to be learned from this discovery," says Galili. "It is the earliest known case of TB of this kind in the world... what we found here shows that it is a different virus than what is found today in humans. This TB didn't come from cows; it's a completely different type."

HOW DID the village come to be submerged?

"There are several theories," Galili explains. Some say the site was hit by a tsunami, an effect of Mt. Etna's eruption and landslide from Sicily 8,000 years ago, but this was not generally accepted. Galili is convinced that the process was slower. "There isn't the typical damage to artifacts and structures that one would expect from a sudden disaster," he points out. Also, he notes, most of the animal bones bear cut marks, indicating that they were consumed, rather than killed by a tsunami.

He also points out a number of changes that suggested that the villagers were aware of the rising sea levels. In what appears to have originally been a well, archeologists discovered a wealth of refuse and concluded that as the sea rose and the water became increasingly saline, it was turned into a trash pit. According to current estimate, when the well was built 9,000 years ago, it was five meters above sea level, several hundred meters from the shore - which would put the sea level at about 16 meters lower than it is today.

Some 20,000 years ago, the Ice Age reached its peak and soon after, melting ice caused sea levels to rise. Still, at the beginning of the Holocene Period, about 10,000 years ago, the Mediterranean's level was about 30 meters lower than at present. Tectonic tilting and climate change dried up some of the swampland on the Carmel coast, making conditions more favorable for coastal settlement. However, over the next two millennia the sea continued to rise and Atlit-Yam was eventually submerged.

Standing on an observation platform in what was once part of a British Army camp, Galili points out the panorama of Atlit. In front of us is the modern Salt Works, founded in 1919, and he explains how the topography of the Carmel Coast between Atlit and Dor has made this a center of salt collection through the ages. Natural troughs in the landscape hold the sea water and the summer sun causes the brine to evaporate. Galili explains that the area links the various periods of history through topography and natural resources, each one a fascinating story on its own. His interest in Atlit is not confined to 9,000-year-old findings. With Rina Tirosh, he wrote *Shvil Hareches (Ridge Path)*, a guide to the more recent, as well as ancient, history of Atlit. He has inspired a group of local schoolchildren to clear up a historical site in the heart of the town and create a park, complete with a wildflower garden and ancient quarries.

Moving through Atlit, he picks up every piece of litter he sees.

TOWARD THE end of winter, after the only heavy rainfall of the season, the Oren River outlet - whose source is high in the Carmel - is visible as a narrow stream pouring into the sea. Usually, the beach sand blocks whatever flow might remain. But 9,000 years ago, the Oren River was a raging flow of water during the winter and Atlit-Yam's inhabitants built a wall of baked clay bricks 20 meters long, one to two meters thick, to protect the village from river floods. Other construction included storage holes for firewood and raised stone platforms for cooking (by steaming or smoking). A large concentration of flint artifacts, including fishhooks and stone sinkers - similar to those used today - gives away the "industrial" nature of Atlit-Yam.

Adding to the intrigue of the ancient community, a megalithic circle of upright stones, reminiscent of Stonehenge, points to a center of ritual gatherings. Nothing more is known about ritual life in Atlit-Yam, but Galili says that the researchers have identified dozens of "cup-marks" (round cavities cut in stone slabs) on the megalith, as well as traces of

spring water in the center of the structure, which led his team to conclude that the stone circle was associated with some kind of water ritual. Galili notes that similar cup marks near a water spring were found in a Chalcolithic-era shrine site near Ein Gedi.

"There are other possible options for the use of this structure, but we can't be sure about them," he muses. As to whether the site might have served some sort of astronomical purpose, Galili notes that any connection between the site and the sun, stars or moon would be "somewhat speculative."

"One should also take in consideration that the position of the stars, the moon and the sun was not the same [when the village existed] as it is today. Hopefully, future studies will shed light on this issue."

Galili stresses that the work at Atlit-Yam is "the window of opportunity."

"For thousands of years, this submerged village has been preserved under the sand. After the severe storms of the early 1980s, the sand shifted and revealed the hidden village. Before the sea rises more and the sand shifts again, we have to complete the rescue of Atlit-Yam.

"If we don't finish this project now, all will be lost," he laments.

"With global warming and the possible rising of sea levels, Atlit-Yam will not be protected any more by those sands and any structures or artifacts that we have not discovered now will be lost."

Whether this is the site of the Biblical flood, another theory of the submersion of the city, or there is a story similar to Atlantis can only be explored with more under-water surveys.

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## **SCIENTISTS BATTLE TO REPRODUCE ANCIENT GLUE BY SHAUN SMILLIE**

It was a sticky solution that helped bring down massive horned buffaloes, and proves that men from the middle Stone Age were a lot smarter than previously thought.

In a cave in KwaZulu-Natal, scientists believe they have found the earliest examples of superglue, more than 70 000 years old. The glue, say the scientists, is just as good as the stuff found in hardware stores today.

Microscopic traces of the glue were discovered by Wits University residue analysts Bonny Williamson and Marlize Lombard. They found it on stone tools recovered from Sibudu cave, along the KwaZulu-Natal North Coast.

They had to be competent chemists, alchemists and pyrotechnologists. The tools are believed to have been spear or arrow heads glued to wooden shafts.

But academics were stunned when they tried to make a batch of the ancient adhesive themselves.

"I thought I was stupid, I just couldn't get it right," said Lyn Wadley, an archaeologist at Wits University.

The ancient recipe included coarse red ochre, acacia gum and even a bit of sand. Sometimes a bit of animal fat was thrown in. Getting the right mix was just the first step, as the prehistoric adhesive had to be dried next to a fire.

Temperature control was crucial, Wadley found, as the adhesives could burn or boil, forming air bubbles.

They had to be competent chemists, alchemists and pyrotechnologists, Wadley believes.

After much trial and error, Wadley eventually made herself some glue - and with it walked away with a new respect for these prehistoric people.

"This shows that they were multitasking at some level, and demonstrates the use of complex cognitive abilities," said Wadley.

To test the strength of the glue, Wadley made a few replica stone tools and used them to chop wood. "The glue-maker needs to pay careful attention to the condition of ingredients before and during the procedure," Wadley said, "and must be able to switch attention between aspects of the methodology without losing track of the long-term goal."

She believes there is an overlap in the mental abilities of modern humans and those who lived in what is known as the middle Stone Age.

Wadley points out that even today some modern humans find multitasking difficult.



The research teams' findings have been published in the journal Proceedings of the National Academy of Science.

Having industrial-strength glue was a necessity 70 000 years ago.

"You couldn't afford for a spear to break. Against something like a buffalo, you only had one chance," Wadley said.

These weren't the Cape buffaloes of today; this now extinct beast was known as Pelorovis antiquus and it had a horn span of 3m. Pelorovis dwarfed the Cape buffalo.

Wadley and her team have found Pelorovis bones in the cave, suggesting that the giant bovine was on the menu.

Some of the stone tools examined revealed that the glue was brittle, and Wadley believes it might have been used as part of a hunting technique to bring down big game like Pelorovis.

"We found some tools that only had plant gum. Maybe these stone tools would break off on impact, causing massive haemorrhaging in the animal. They would then perhaps follow the trail and wait for it to die," said Wadley.

The research team plans to examine other stone tools from earlier periods to see if they too contain the microscopic telltale signs of the substance.

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## **COMPUTER SCIENTIST TO 'UNROLL' PAPYRUS SCROLLS BURIED BY VESUVIUS [BC-SCI-VESUVIUS- SCROLLS:LX]**

(Lexington Herald-Leader (KY) Via Acquire Media NewsEdge) LEXINGTON, Ky. On Aug. 24, 79 A.D., Italy's Mount Vesuvius exploded, burying the Roman towns of Herculaneum and Pompeii under tons of super-heated ash, rock and debris in one of the most famous volcanic eruptions in history.

Thousands died. But somehow, hundreds of papyrus scrolls survived \_ sort of \_ in a villa at Herculaneum thought to have been owned at one time by Julius Caesar's father-in-law.

The scrolls contained ancient philosophical and learned writings. But they were so badly damaged \_ literally turned to carbon by the volcanic heat \_ that they crumbled when scholars first tried to open them centuries later.

The remaining scrolls, stored away in Italy and France, haven't been read \_ or even unrolled \_ since 79 AD.

Now, a computer scientist from the University of Kentucky hopes that modern digital technology will allow him to peer inside two of the fragile scrolls \_ without physically opening them \_ and unlock secrets they have held for almost 2,000 years.

Brent Seales, the Gill professor of engineering in UK's computer science department, will use an X-Ray CT scanning system to collect interior images of the scrolls' rolled-up pages. Then, he and his colleagues hope to digitally "unroll" the scrolls on a computer screen so scholars can read them.

"It will be a challenge because today these things look more like charcoal briquets than scrolls," Seales said. "But we're using a non-invasive scanning system, based on medical technology, that lets you slice through an object and develop a three-dimensional data set without having to open it, just as you would do a CT scan on a human body." The two scrolls that Seales and his team will work on are stored at the French National Academy in Paris. The UK group will spend July working there.

Their system was developed at UK through the EDUCE project, or Enhanced Digital Unwrapping for Conservation and Exploration, which Seales launched through a grant from the National Science Foundation.

Experts say that if the UK system works as well as hoped, it could provide a safe new way to decipher and preserve more scrolls from Herculaneum, as well as other ancient books, manuscripts and documents that are too fragile to be opened.

"No one has yet really figured out a way to open them," says Roger Macfarlane, a professor of classics at Brigham Young University who also has worked on scrolls from

Herculaneum. "If Brent is successful it would be a huge, potentially monumental step forward." Seales admits that there are hurdles, the biggest being the carbon-based ink thought to have been used on the scrolls. He says that since the papyrus in the scrolls was turned to carbon by the fury of Vesuvius, it might be impossible to visually separate the writing from the pages, even with powerful computer programs.

"The open question is, will we be able to read the writing?" Seales said. "There is a chance that we won't be able to do it with our current machine, and that we'll have to re-engineer some things. But if that's the case, that's what we will do." Seales, who is from Buffalo, N.Y., grew up with two passions: computers and the humanities. His double major in undergraduate school was computer science and violin. While working on computer imaging in graduate school, Seales became interested in how that technology might be used to digitally preserve old manuscripts and documents.

By the early 1990s, he was developing systems to read old records that were crumpled and wrinkled with age. As a result, he joined an international computer team that digitized the oldest known complete text of Homer's Iliad, which is stored in Venice, Italy. The project, ultimately completed at UK's Center for Visualization and Virtual Environments, produced new digital images, bringing to life sections of the text from the 10th century B.C. that previously were little more than ink smudges.

Developing a method to virtually unroll and copy ancient documents too delicate for normal handling was the next step. This is the system that Seales and his colleagues will use on the Herculaneum scrolls.

If it works, what will they find? The best guess is that the scrolls contain writings by Philodemus, a Roman writer and Epicurean philosopher born about 110 B.C. Philodemus is not considered a classical thinker of the first rank, but he was a contemporary of Cicero. He taught Virgil and is thought to have influenced the Roman poet Horace.

Philodemus also was a friend of Lucius Calpurnius Piso – the father-in-law of Julius Caesar – who at one time owned that luxurious villa at Herculaneum.

The mansion had passed to other hands, however, when it and Herculaneum were buried during the eruption of 79 A.D. Afterward, Herculaneum lay hidden for 1,600 years, until excavators stumbled upon it in 1709.

The villa itself was not uncovered until the mid-1700s. Inside its library, investigators found what they first thought to be lumps of coal but that turned out to be papyrus scrolls – about 1,800 in all – fused into blackened cylinders by furious volcanic heat. The building became known as the Villa of the Papyri.

(EDITORS: BEGIN OPTIONAL TRIM) According to Seales, the scrolls did not burn because the building so was completely encased in ash and lava that no oxygen was available to feed any flames.

Ironically, experts say that the papyrus, made of plant material, almost certainly would have decomposed over the last 2,000 years had it not been sealed in what amounted to an airtight vault.

What survived was incredibly fragile. Many scrolls simply crumbled when early researchers tried to open them. A Vatican priest eventually developed a way of opening a few scrolls, but it was slow and produced mixed results. Most were never unrolled.

(END OPTIONAL TRIM)The majority of the scrolls ultimately went to a library in Naples. But Napoleon had several shipped to France when he took over Italy after 1800. Among these scrolls are the two that the UK team plans to investigate.

Seales describes the process as resembling a "virtual colonoscopy," a medical test for colon cancer.

"In a colonoscopy, you're interested in whether there's cancerous activity on the wall of the colon," he said. "So you can imagine locating that in a scan, then flattening it out and manipulating it to see what you can see. We'll be doing a similar sort of thing."(EDITORS: STORY CAN END HERE)According to Seales, many experimental scans probably will be necessary, plus much additional computer work afterward, to produce clear images.

Members of the UK group won't touch the fragile materials. All handling will be done by conservators at the French National Academy.

Macfarlane, the Brigham Young University scholar, predicted that if Seales' team is successful, other Herculaneum scrolls probably also will be made available for scanning. Those could contain works by other ancient writers, more important than Philodemus, perhaps by Epicurus, who founded one of the major philosophies of ancient Greece, Macfarlane said.

"If Brent does unlock the door to reading these scrolls that are still hiding text, there will be a lot of excitement," he said.

Seales sees other potential applications for the system, including deciphering otherwise unreadable written materials for homeland security purposes. But, he also admits that there are other ancient tests he'd like to examine.

"There are pieces of the Dead Sea scrolls that still haven't been opened yet," he said. "I've talked with some members of teams that work with those materials, and I'd love to see what more we could wring out of them.

"I guess I just like solving mysteries." \_\_\_(c) 2009, Lexington Herald-Leader (Lexington, Ky.).

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## **HISTORICAL ANECDOTE OF JORDAN'S RED SOILS MAY OFFER NEW ANTIBIOTIC**

ScienceDaily (May 21, 2009) — Historical anecdotes of the red soils from the Hashemite Kingdom of Jordan tell of people using the soils to treat skin infections and diaper rash. A multinational group of researchers suggest the healing power may be due to antibiotic-producing bacteria they have found living in the soil. This discovery may ultimately lead to new antibiotic treatments against harmful pathogens such as *Staphylococcus aureus*.

The increasing incidence of antibiotic-resistant bacteria, especially the methicillin-resistant *S. aureus* in communities and hospitals, has placed great emphasis on the need for new antimicrobial agents to treat infectious diseases. In an attempt to uncover such resources researchers are exploring some historically recognized natural remedies which are still being used in some communities as an alternative to expensive pharmaceutical drugs.

In the study researchers collected samples of red soils from various geographic locations throughout the Hashemite Kingdom of Jordan and inoculated them with *Micrococcus luteus* and *S. aureus*. Results showed the bacteria were rapidly killed. Additionally, over a three-week incubation period, researchers found that the number of antibiotic-producing bacteria (specifically actinomycetes, *Lysobacter* spp. and *Bacillus* spp.) increased and high antimicrobial activity was observed. Further, no myxobacteria or lytic bacteriophages with activity against *M. luteus* or *S. aureus* were detected in the soils before or after inoculation and incubation.

"These data provide a rationale for the traditional use of Jordan's red soils for the treatment of skin infections, including diaper rash," say the researchers. "We hypothesize that the application of red soils to an infected area of skin (i.e. inoculation) leads to the proliferation of bacteria that produce antibiotic compounds, killing the infecting skin microbiota."

### **Journal reference:**

1. Falkinham et al. Proliferation of Antibiotic-Producing Bacteria and Concomitant Antibiotic Production as the Basis for the Antibiotic Activity of Jordan's Red Soils. *Applied and Environmental Microbiology*, 2009; 75 (9): 2735 DOI: 10.1128/AEM.00104-09

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