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Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Ιανουάριος 2011 -

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ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS
ANCIENT METALLURGIES COMPARED,
THIRD INTERNATIONAL CONFERENCE
ON EXPERIMENTAL ARCHAEOLOGY,
BLERA - CIVITELLA CESI 8 - 10 APRIL
2011

Website in English: <http://www.antichemetallurgie.com/EN/default.html>

Contact: <<mailto:archeosperimentale@antiquitates.it>>
archeosperimentale@antiquitates.it

PROGRAM

- FRIDAY, APRIL 8 – 2011 “Experimentation and Scientific Popularization.”
- SATURDAY, APRIL 9 – 2011 “Experimentation and Archaeological Science.”
- SUNDAY, APRIL 10 – 2011 “Experimentation, education and scientific tourism.”

Metallurgy and experimentation

In antiquity, metallurgy developed in many areas, and each population interjected its own cultural characteristics, in the form of methodologies, procedures and techniques. Sometimes the cultural choices were dictated by practical circumstances, such as the availability of a certain ore. We can thus speak of Cypriot, Etruscan, Celtic, African, Japanese or Turkish metallurgy, each one with its own special features. While smelting methods for copper and copper alloys developed first in Europe and Asia. In Africa, the first metal to be used was iron, and iron smelting and processing methods developed fairly early.

The workshop will be held in Etruria, a region rich in deposits of metal-bearing minerals. Here metallurgy developed in the late Neolithic, and contributed substantially to the development and wealth of Etruscan civilization.

Our knowledge of the skills used in the earliest metallurgies is relatively limited, due in part to the fact that very little documentation has come down to us. An important contribution to research comes from experimental archaeology, which, seeking to reconstruct ancient metallurgical processes, gives scientific researchers irreplaceable information. Unlike the situation in Italy, this type of research has been pursued for decades elsewhere in Europe and in the United States.

Experimental archaeology also offers the possibility of communicating directly with the contemporary world, making it easier for the general public – especially the younger

generation – to study and understand archaeological problems, and arousing interest in research that is often confined to small groups of specialists.

There is still no general agreement on the procedures to be followed in this type of experimentation. One of the purposes of this conference is thus to open a discussion aimed at working out common strategies and methodologies to delineate an innovative concept of experimentation in archaeometallurgy.

The scientific problem

The Antiquitates Center for Experimental Archaeology is situated in the heart of Viterban Etruria, on the slopes of the Tolfa Mountains. A good deal of evidence indicates that Tolfa ores have been mined since antiquity. The Center has long engaged intensely in scientific activities related to archaeological experimentation, upon which researchers and scholars have drawn. The organization – unique in Latium – is thus able to offer the indispensable logistical support and know-how needed for the upcoming workshop.

The workshop program has two purposes: to examine the potential and the applications of experimental archaeology for disseminating knowledge and in education; and to bring together archaeometallurgy scholars in order to create the basis for an international experimentation protocol. The meetings will be held over three days, during which experts and experimenters will be able to suggest and plan out the best methods for obtaining the maximum scientific results from experiments. The investigative methodologies they work out will be field-tested at the Antiquitates Center. During the workshop, different methodological approaches to metallurgy will be tested, based on data provided by archaeological research. Furnaces from different historical/cultural traditions will be built, such as the ones used in the Etruscan, Cypriot, Celtic, central-African, Japanese and Turkish worlds.

Details

From April 8 to 10, 2011, the Antiquitates Center for Experimental Archaeology, at Civitella Cesi (Viterbo), will host the Third International Conference on Experimental Archaeology, “Metallurgies Compared: Archaeology and Experimentation.” The conference, organized in three sessions of presentations alternating with experimental activities, will be attended by many Italian and European scholars.

Participants may present works in the form of posters, according to the rules to be announced by the organizing committee. The deadline for communication is by February, 8, 2011.

The registration fee is €100 and includes the opportunity to participate in the poster session. Admission applications should be submitted by March 30, 2011. Regarding meals and accommodations, attendees may stay at Antiquitates’s facilities at a special rate, or at hotels and hostels in nearby Blera. The conference will be open to a maximum of 70 attendees. Participants will be selected based on the CVs submitted with their admission application, which should specify all relevant information (activities conducted, course of study, scientific qualifications, publications, etc.). Admission applications should be submitted by March 20, 2011, at the conference website:

www.antiche metallurgie.com. The conference proceedings will be made available to the scientific community in Italian and English on a website that will include experiment results and videos.

Committees

Scientific committee: A.M. Bietti Sestieri, C. Caneva, G. Fiorentino, C. Giardino, M. Pearce, S. Rovira

Organizing committee: A. Bartoli, C. Cappelletti, C. Giardino, G. Lattanzi, L. Santella

Coordinating Committee: C. Fierro, L. Maltese, T. Mastracci, S. Moscatelli, C. Traina, U. Savarrese

Scientific program

Friday, April 8, 2011

Session I

Experimentation and Scientific Popularization. Comparing experiences in disseminating knowledge of archaeological research through experimental activities.

09:30 A. Bartoli (Italy): The decades-long experience of the Antiquitates Center

10:00 S. Rovira (Spain): Research on the Iberian Peninsula

10:30 P. Halkon (U.K.): The role of experimental archaeology in understanding Iron Age archaeology

11:00 Coffee break and visit to the smelting furnaces

11:30 Discussion and comments on the furnaces

12 p.m. T. Burka (Ethiopia): Between experimental archaeology and ethnoarchaeology. Research on Ethiopian furnaces

12:30 D. Leopp (U.S.A.): Experiments in gold refining

1:00 Lunch

3:30 C. Bottini, R. Villaça (Portugal): Archaeometallurgical research in the Portuguese area

4:00 Discussion

4:30 Coffee break

5:00 M. Pearce (U.K.)

5:30 Experimental activity: Opening the iron-smelting furnaces

Saturday, April 9, 2011

Session II

Experimentation and Archaeological Science: In search of an archaeometallurgical protocol.

9:00 Nagai Yutaka (Japan): Shagudo and other ancient Japanese techniques

9:30 I. Montero (Spain)

10:00 C. Giardino (Italy)

10:30 A. M. Bietti Sestieri (Italy)

11:00 Coffee break and visit to the smelting furnaces

11:30 Discussions and comments on the furnaces

12 p.m. C. Caneva (Italy)

12:30 G. E. Gigante (Italy)

1:00 Lunch

3:30 C. M. Cavallini (Italy)

4:30 Coffee break

5:00 E. Formigli, D. Ferro (Italy)

5:30 Experimental activity: Opening iron-smelting furnaces

Sunday, April 10, 2011

Session III

Experimentation, education and scientific tourism: Potential and limitations of the experimental approach.

9:00 R. Poggiani Keller, M. Baioni, C. Mangani (Italy): The experience of the Lombardy museum network

9:30 Poster presentation and discussion

11:00 Coffee break and visit to the smelting furnaces

11:30 A. De Santis, G. Pulitani (Italy) : Educational activities in Rome

12 p.m. Discussions and comments on furnaces used to smelt metals and craft objects (copper, copper alloys, iron, gold)

1:00 Lunch

3:00 C. Demarez: The experience of the Archéosite d’Aubechies (Belgium)

3:30 Final remarks and discussion

6:00 Conclusions

RADIOCARBON AND ARCHAEOLOGY, **6TH INTERNATIONAL SYMPOSIUM,** **PAFOS, CYPRUS, APRIL 10-15, 2011**

**TENTATIVE SESSIONS UPDATE & REMINDER OF ABSTRACT
SUBMISSION DEADLINE: January 17, 2011**

Visit the Symposium website: <http://www.c14.cyi.ac.cy/>

We kindly remind you that January 17, 2011 is the deadline for submitting an abstract for the Radiocarbon and Archaeology, 6th International Symposium.

SYMPOSIUM TOPICS

Papers (oral or poster presentations) on all aspects of research and applications of Radiocarbon, Archaeology and Archaeological Science are welcome. Problem oriented, comparative studies, as well as papers addressing advances, problems and new challenges for this technique are also called for. The geographical and chronological scope of the conference is open to local and global studies. Tackled topics are radiocarbon methods, calibration tools, absolute and relative chronologies. Field-related aspects related to radiocarbon dating like the application of micromorphology to resolve disturbances in the deposition of the ^{14}C sample, as well as non-conventional sample materials for radiocarbon dating, special conditions for their collection, characterization and preparation are also called for.

These topics are not exclusive and all related studies are welcome.

UPDATED TENTATIVE SESSIONS:

1. The use of radiocarbon in historical periods.
2. Radiocarbon research in the 1st Millennium BC.
3. Radiocarbon research in the 2nd Millennium BC.
4. Radiocarbon research in the 3rd Millennium BC.
5. Reliability of ^{14}C dates beyond 30Ka.
6. Radiocarbon chronologies in the Far East.
7. Ancient cultures of the Eurasian steppes: chronology, migrations and interaction.
8. Calibration, intercomparison, models and outliers.
9. Dendrochronology and botanical remains.
10. Special archaeological materials and techniques for dating.
11. Prehistorical periods
12. Radiocarbon samples preservation in relation to different environments.

Instructions for the preparation of abstracts, as well as registration & accommodation information, can be found on the symposium website.

Abstracts should be submitted to the secretariat by email attachment:
radioarch@targetconf.com

On behalf of the Organizing Committee, may we take this opportunity to wish you all the best for the holiday season and a healthy and prosperous New Year.

We hope to welcome you to Pafos in April 2011.

The Secretariat

Radiocarbon and Archaeology
6th International Symposium
Pafos, Cyprus, April 10-15, 2011
Symposium Secretariat
radioarch@targetconf.com
<http://www.c14.cyi.ac.cy/>

on behalf of the Organizing Committee

Dr. Elisabetta Boaretto, Symposium Chair, Bar Ilan University and Weizmann Institute of Science
Dr. Ayelet Gilboa, University of Haifa
Dr. Vasiliki (Lina) Kassianidou, University of Cyprus
Dr. Hamoudi Khalaily, Israel Antiquities Authority
Dr. Kirsi Lorentz, STARC Cyprus Institute
Prof. Aren Maeir, Bar Ilan University
Prof. Franco Nicolucci, STARC Cyprus Institute
Dr. Ilan Sharon, Hebrew University of Jerusalem
Prof. Steve Weiner, Weizmann Institute of Science
Noemi Rebollo, Symposium Scientific Secretary
Weizmann Institute of Science



FIRST CIRCULAR OF "HISTORY, TECHNOLOGY AND CONSERVATION OF ANCIENT METALS, GLASSES AND ENAMELS"

Dear Colleagues,

It is my pleasure to announce the organization of a symposium entitled “History, Technology and Conservation of Ancient Metals, Glasses and Enamels”, International Symposium, November 16-19, 2011, Athens, Greece. The last day of the symposium will be devoted to the second conference “Hyalos-Vitrum-Glass”. This part of the symposium will be devoted to archaeology issues of glass. Corrosion and restoration issues of glasses will be treated in the first two days of the symposium.

The first circular shows the international steering committee as well as other important aspects of the organization. We will send you also additional information regarding the organization of the symposium, e.g. the website that will be ready in few days.

The organizing committee invites you to participate at the symposium and contribute with your work to the success of this important event.

Sincerely yours

George Kordas
Co-chairman
email: gkordas@ims.demokritos.gr

General

The N.C.S.R. “Demokritos”/Institute of Materials Science and The National Technical University of Athens (NTUA)/Department of Chemical Engineering organizes an International Symposium on “History, Technology and Conservation of Ancient Metal, Glasses and Enamels”, to be held in Athens, 16 - 19 November 2011. The symposium is expected to attract to a fruitful meeting researchers, scientists, archaeologists, conservation scientists and executives who are involved in the history, technology and conservation of ancient materials in Greece and the adjacent areas. The official language of the Symposium will be English.

Aim

The International symposium “History, Technology and Conservation of Ancient Metal, Glasses and Enamels” will give emphasis to topics related to the technology of fabrication and of conservation of ancient materials, focusing in findings from Greece and the adjacent areas. The symposium will also emphasize related topics to understanding and predicting the chemistry and technology of the fabrication, behavior,

corrosion and properties of ancient materials (Copper - Bronze - Steel - Brass - Lead, Glasses and Enamels). The conference will consist of the topics:

1. History and objects
2. Structure and Properties
3. Dating techniques and applications
4. Technology (Raw materials, Furnaces, Melting, and Forming)
5. Corrosion of ancient materials
6. Modern aspects of corrosion of materials
7. Conservation

A special thematic session entitled “Hyalos - Vitrum - Glass: Ten years later” including review articles and outstanding papers dealing with vitreous material of the Mediterranean region, is going to be held on the occasion of completing ten years after the important Conference Hyalos - Vitrum - Glass, organized in Rhodes - Greece, 3 - 5 April 2001.

Organizing Committee:

Dr. G. Kordas, Sol - Gel Laboratory, Institute of Materials Science, N.C.S.R. “Demokritos”, Athens

Prof. P. Vassiliou, Laboratory of Physical Chemistry, School of Chemical Engineers, NTUA

Dr. Y. Bassiakos, Laboratory of Archaeometry, Institute of Materials Science, N.C.S.R. “Demokritos”, Athens

Dr. L. Filippaki, Laboratory of Plasma Physics, Institute of Materials Science, N.C.S.R. “Demokritos”, Athens

International Steering Committee

Emma Angelini, Dipartimento di Scienza dei Materiali ed Ingegneria Chimica, Torino, Italy

Justine Bayley, Editor, J. historical Metallurgy, Ass. for the History of Glass, Un. College London, UK

Joost M.A. Caen, Hogeschool Antwerpen, Conservation Studies, Antwerpen, Belgium

Patrick Degryse, Department of Earth and Environmental Sciences, K.U. Leuven, Belgium

Mário G.S. Ferreira, Dep. of Ceramics and Glass Engineering, Univ. de Aveiro, Portugal

Costas Fotakis, Institute of Electronic Structure and Laser, FORTH, Heraklion, Greece

Ian C. Freestone, Department of Archaeology Cardiff, UK

Sabrina Grassini, Dipartimento di Scienza dei Materiali ed Ingegneria Chimica, Torino, Italy

Susanne Greiff, Römisch - Germanisches Zentralmuseum, Mainz, Germany

Bernard Gratuze, Institut de Recherche sur les
ArchéoMATériaux, Univ. d'Orléans, France

Caroline Jackson, Department of Archaeology,
Sheffield, UK

Julian Henderson, Dep. of Archaeology, The
University of Nottingham, Nottingham, UK

Anna Michailidou, Institute for Greek and Roman
Antiquity, NHRF, Athens, Greece

M. Fatima Montemor, ICEMS, Instituto Superior
Tecnico, Technical Univ. of Lisbon, Portugal

George Papadimitriou, Department of Mining and
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Thilo Rehren, Institute of Archaeology, University
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Oren Tal, The J.M. Alkow Department of
Archaeology & ANE Cultures, Tel Aviv Univ., Israel

George Thompson, School of Mat. Corr. & Protect.
Centre, The Univ. of Manchester, UK

George Varoufakis, University of Athens,
Halyvourgiki Inc., Athens, Greece

David B. Whitehouse, The Corning Museum of
Glass, Corning NY, USA

Important Deadlines

Papers for presentation will be accepted on the basis
of extended abstract review with the following
sequence of deadlines:

Abstract submission: June 20, 2011

Selection of Papers: September 30, 2011

Submission of manuscripts: November 16, 2011

Contact:

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A. Korda,

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Registration

Registration fee before September 30, 2011 will be 180 euros (70 euros for students). After September 20, 2011 the registration fee will be 220 €. A number of reasonably priced hotels will be available to host the participants.

If you wish to participate, please fill out the form below and send it to one of the contact persons.

Registration Form

Please fill in the form and send it back before June 20, 2011. Speakers, please send us an abstract of no more than 600 words by e - mail, fax, or mail, by the same date to:

L. Filippaki, email: lfilip@ims.demokritos.gr

A. Korda, email: akordas@ims.demokritos.gr;

Oral / Poster presentation (preference):

Family Name:

Name:

Academic Title:

Student (stamped verification needed):

Institution:

Complete Professional Address:

Telephone:

Fax:

E - mail:

Title of Your Lecture:

Joint Authors:

Abstract:

Title of contribution

Names*

Addresses (Department, Institute, City, Zip code, Country)

Text (maximum 600 words, justified, 12ppt, Times New Roman)

*email (only of the speaker):

INTERNATIONAL EDELSTEIN COLOR SYMPOSIUM: IECS 2011 - FEB. 28

Dear Colleague,

It gives me great pleasure to invite you to a unique symposium on the “science & art of color”, which is scheduled for Monday, February 28, 2011 at the Shenkar College of Engineering and Design located in Ramat-Gan near Tel-Aviv. The title of this interesting and diverse interdisciplinary program is iECS (*pronounced “eye-ex”*):



The Science & Art of Color

This symposium will convene experts in their fields who will discuss the use of color in modern design, architecture, painting styles, women’s fashion, as well as the psychology and philosophy of color. The nature of pigments and dyes, as detected by scientific methods, in use in historic paintings, medieval manuscripts, and ancient European textiles will also be presented. Additionally, the scientific discovery of the first authentic Biblical Tekhelet from ancient Israel will be announced and discussed.

We also have a very interesting pre- and post-symposium program for those who register. On the Sunday prior to the symposium, all registrants will be treated to a guided tour of the newly renovated Israel Museum in Jerusalem, which exhibits relics from prehistory to modern art; a tour of a Biblical village and a royal supper is also scheduled. On the days following the symposium, three one-day Study Tours of some of the most popular sites in Israel are planned at very reasonable rates.

The registration is now open and I urge you to reserve your place soon in this colorful event in order to take advantage of the very attractive and nominal early-bird registration fee.

In addition, all those interested in presenting their work as a Poster Presentation are urged to submit their abstract as the Call for Posters is now open.

All the details regarding this symposium are available at its website whose address is:

www.edelstein-center.com/color-symposium

Please forward this letter to your colleagues and friends who may be interested in these events.

On behalf of the organizing committee I look forward to personally welcoming each and every one of you to iECS 2011 – the Celebration of Color.

Sincerely,

Zvi

Prof. Zvi C. Koren
Director, The Edelstein Center for the Analysis of Ancient Artifacts
Department of Chemical Engineering
Shenkar College of Engineering and Design
12 Anna Frank St., 52526 Ramat-Gan, Israel
Tel: +972-54-8050066
edelstein-center.com/color-symposium
edelsteincenter.wordpress.com



**CALL FOR PAPERS FOR THE SESSION:
THE IDEATIONAL ARCHAEOLOGICAL
LANDSCAPE: ARCHAEOLOGICAL
SITES, CULTURAL HERITAGE,
TOURISM AND PUBLIC IMAGINATION,
US TAG IN BERKELEY, 6-8TH MAY 2011**

Dear colleagues,

Please find below a Call for Papers for the Session *The ideational archaeological landscape: archaeological sites, cultural heritage, tourism and public imagination* to be held at **US TAG in Berkeley, 6-8th May 2011**.

The link to the form to submit a paper is at <http://arf.berkeley.edu/TAG2011/call-for-papers/>

Deadline for submission **31 December 2010**. If you have any questions, please contact the session organisers.

With best wishes
Stella Souvatzi

CALL FOR PAPERS:

The ideational archaeological landscape: archaeological sites, cultural heritage, tourism and public imagination

Session at the Theoretical Archaeology Group USA 2011 Berkeley 6-8 May 2011

Session organisers: Stella Souvatzi stellasouvatzi@hotmail.com and Athena Hadji athenahadji@yahoo.gr

Session Abstract

This session seeks to investigate the politics of the past with reference to archaeological sites and landscapes as objects of deliberate construction of the past as cultural heritage and of tourist consumption, as well as the popular strategies of representing those sites to the public.

Public attitudes range from the initially Roman concept of *genius loci* (“the spirit of the place”), to visiting an archaeological site as part of a quest for authenticity for a class of 21st century “nomads” that culturally informed tourists tend to be. The construction and management of cultural heritage involve control of knowledge in which the past is translated into and represented through a number of visitable archaeological sites. The issues surrounding how representations are constructed and communicated are vitally important, given the growing concern over the public impact and social relevance of archaeology and its epistemological status. Essential theme of inquiry is the idea of space – in particular archaeological sites - and how it is transformed in relation to tourism and because of its consequences. Space is

perceived not only as a three-dimensional entity, but primarily as a notional and ideational construct, (c.f. “the island”, “the historical site”, “the resort”). Meanings of identity and power also take many site and landscape forms, involving, among other things, the promotion of certain sites and landscapes over others.

We welcome contributions from archaeological theory and heritage studies, as well as tourism, that address critically one or more of the above issues.

Further details about the session and conference can be found at:

<http://arf.berkeley.edu/TAG2011/sessions/the-ideational-archaeological-landscape-archaeological-sites-cultural-heritage-tourism-and-public-imagination/>

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –
JOB VACANCIES/FELLOWSHIPS

PALAEOECOLOGICAL AND
ARCHAEOLOGICAL POSTGRADUATE
PROJECTS AT QUEEN'S UNIVERSITY
BELFAST

Dear colleagues,

A range of palaeoecological and archaeological postgraduate projects is available at the School of Geography, Archaeology and Palaeoecology at Queen's University Belfast. Topics include:

Can we determine open-ness in the palaeoecological record? Interpreting Holocene woodland and cultural landscapes using modern analogues (supervisors: Dr. Whitehouse, Dr. Plunkett, Dr. Smith [Univ. Birmingham]).

Global timing of abrupt climate change events 60-0 kcal BP (supervisors: Prof. Reimer & Dr. Blaauw).

Discrimination of global methane sources with isotopic methodologies (supervisors: Prof. Reimer, Dr. Ostle & Dr. McNamara [NERC Centre for Ecology and Hydrology]).

The past as a key to the future of hyperdiverse ecosystems: modelling biodiversity variation and resilience through records of Late Pleistocene and Holocene environmental change and human activity in Thailand (supervisors: Dr Hunt, Prof. Reimer & Prof. Wohlfarth [Univ. Stockholm]).

¹⁴C-based chronology of the Iberian Chalcolithic and Bronze Age sequence (3rd–early 1st millennia BC): a Bayesian approach (supervisors: Dr. Dirk Brandherm, Dr. Maarten Blaauw & Prof. Paula Reimer).

Classification, material composition and function of Irish Middle Bronze Age flanged axes and palstaves (supervisors: Dr. Dirk Brandherm, Dr. Gill Plunkett & Dr. Finbar McCormick).

More information can be found on the web:

<http://www.qub.ac.uk/schools/gap/ProspectiveStudents/PostgraduateStudies/PhDProjects2011-2012/>

A number of DEL awards is on offer, which cover all fees and a maintenance grant for 3 years. These awards are open to all EU citizens, but there are strict UK residency requirements for the receipt of the maintenance allowance. The total number of awards on offer is yet to be determined and further projects may be advertised.

Please pass this message along to any potentially interested students.

Many thanks,

Maarten

Dr. Maarten Blaauw

School of Geography, Archaeology & Palaeoecology Queen's University
Belfast, UK

www <http://www.chrono.qub.ac.uk/blaauw>

tel +44 (0)28 9097 3895



EARLY STAGE RESEARCHER POSITION **AT UNIVERSITY OF SHEFFIELD**

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

A Marie Curie Initial Training Network

Early Stage Researcher in Archaeological Ceramics

An opportunity has arisen for an Early Stage Researcher to join the Department of Archaeology of the University of Sheffield to carry out PhD research on the analysis of Neolithic to Bronze Age pottery from excavations in the Mesara Plain of Crete. The research, which will be supervised by Dr Peter Day, will form part of the department's commitment to 'NARNIA: New Archaeological Research Network for Integrating Approaches to ancient material studies', a Marie Curie Initial Training Network, financed under the 'People' programme of the European Union (Proposal Number 265010 Call: FP7-PEOPLE-2010-ITN).

The post offers the possibility of gaining a doctoral degree with a leading research team.

Description

The successful applicant will have an Master of Arts (MA) or Master of Science (MSc) in Archaeology or a relevant subject, preferably at distinction level (or equivalent experience). Previous experience in the practice and research design of ceramic analysis is essential, and experience in the analytical study of ceramics within the Aegean is desirable.

The post-holder will have the ability readily to combine archaeological and scientific information within an integrated programme of research. The post will involve the application of thin section petrography, chemical and micro-structural analysis to archaeological ceramics.

This post is fixed-term with a start date of 1st February 2011 and an end date of 31st January 2014.

The Early Stage Researcher post is offered in the context of a Marie Curie Initial Training Network and transnational mobility is a key element of eligibility. As such, applications will only be accepted from candidates who have spent less than 12 months in the United Kingdom within the last three years.

Applications

To apply for this job please go to www.sheffield.ac.uk/jobs and search for the job using the reference number **UOS002150** and apply online. Application deadline 20th January 2011.

Benefits

£30,151 per annum, with additional allowances as per Marie Curie

NARNIA

For more information about NARNIA

<http://www.ucy.ac.cy/data/archreun/narnia%20information.pdf>).

Vasiliki Kassianidou

Associate Professor

Archaeological Research Unit - Department of History and Archaeology

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<http://www.ucy.ac.cy/~arkasian.aspx>

FITCH LABORATORY SENIOR VISITING FELLOWSHIP 2011-2012

Applications are invited for Senior Visiting Fellowships at the Fitch Laboratory, British School at Athens (BSA) for up to 3 months in the academic year 2011-12, for research in any of the fields in which the Laboratory is active (e.g. inorganic material analysis, geophysical prospecting, zooarchaeology, archaeobotany, soil micromorphology, ethnoarchaeology, landscape archaeology, archaeology of technology; normally in the context of Aegean/Mediterranean archaeology). One or two Fellows will be appointed in each year depending on requests for the Fellowship duration. The Fellowship covers a monthly stipend (500€), accommodation and airfare (up to 400€), as well as limited research expenses (up to 500€). Fellows will be required to submit a report on their research and a short general report on their time at the Laboratory to the Laboratory's Subcommittee and Director.

The Senior Visiting Fellows should be established scholars or scientists (normally at least 5 years beyond receipt of the Ph.D.). Fellowships are intended to enable scholars in post to spend a period of research leave in Greece, for example, during sabbatical. Fellows will be expected to reside at the School and base their research at the Laboratory, for a period of between 1 and 3 months, preferably during the academic year (between October and June). During this time they should conduct a programme of original research either independently or in collaboration with Laboratory staff members. Fellows are also expected to give one public lecture or an open seminar at the BSA.

The Fellowship covers BSA membership and accommodation at the BSA Hostel in Athens and, if required for research purposes, also in Knossos, while accommodation is also offered to an accompanying spouse/partner, who is most welcome, at a nominal daily rate. Regrettably, children cannot be accommodated. Preference may be given to employees of UK HEIs, Museums and other such bodies.

Applications should include a covering letter (indicating the preferred length and period of stay), a Curriculum Vitae, a statement of their proposed programme of research (up to 500 words) and the names and contact details of two referees. Applicants are advised to contact the Laboratory Director if the use of analytical facilities is necessary for the proposed research.

Applications and reference letters should be submitted by 31st January 2011 via e-mail to school.administrator@bsa.ac.uk

Potential applicants may contact Dr E. Kiriati, the Laboratory Director (fdirector@bsa.ac.uk), for further information. Additional details about the School and the Laboratory can be also found at <http://www.bsa.ac.uk/>.

POSITION AT GNS SCIENCE, NATIONAL ISOTOPE CENTRE: RADIOCARBON APPLICATIONS DEVELOPMENT SCIENTIST

Hi All

Please note the following position, and I ask for your help in passing the advertisement on to suitable candidates.

Best regards
Troy

Radiocarbon Applications Development Scientist

The National Isotope Centre (NIC), a division of GNS Science, is the premier source of applied isotope science capability in New Zealand, with a major focus on applying the tools of isotope geochemistry to understand and manage the environment. Our facility hosts a new compact accelerator mass spectrometer (AMS), the world's first compact AMS designed to combine high precision C-14 measurement with Be-10 and Al-26 capability. To support our radiocarbon capability, we seek a suitably qualified and motivated person to take up a position as a scientist focussing on the development of analytical techniques for the processing of radiocarbon samples connected with geochronology and carbon-cycle studies. A suitably qualified candidate is expected to have a post-graduate degree in geochemistry or a related discipline. An ideal candidate would have PhD and post-doctoral experience in radiocarbon applications involving the development of automated methodology or instrumentation and/or analysis of high precision or very small samples. Applicants with substantial backgrounds in instrument engineering in radiocarbon or stable isotope analysis will also be considered.

https://vacancies.gns.cri.nz/jobseeker/safelink=JSJD&O_p=JXyg7&

W. Troy Baisden, PhD
Section Manager
Senior Scientist
Environmental Isotope Section
National Isotope Centre
GNS Science

Ph +64 4 570 4653
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Postal Address:
30 Gracefield Road,
PO Box 31-312,

Lower Hutt,
New Zealand

<http://www.gns.cri.nz/who/staff/2234.html>



ΥΠΟΤΡΟΦΙΕΣ ΑΠΟ ΤΟ ΙΔΡΥΜΑ ΜΠΟΔΟΣΑΚΗ

Το ΙΔΡΥΜΑ ΜΠΟΔΟΣΑΚΗ ανακοίνωσε ότι περιέλαβε στο πρόγραμμα του 2011 τη χορήγηση (55) υποτροφιών για μεταπτυχιακές σπουδές σε Ελληνικά Α.Ε.Ι. ή Πανεπιστήμια άλλων χωρών για το ακαδ. έτος 2011 - 2012. Αίτηση μπορούν να υποβάλουν Πτυχιούχοι ή Τελειόφοιτοι φοιτητές Α.Ε.Ι. των εξής επιστημονικών κλάδων:

1. Βιολογίας

Χωρίς περιορισμό πεδίων μεταπτυχιακού

2. Διοικήσεως Επιχειρήσεων και Οικονομικών Σχολών,

για:

Αναλογιστικά,

Διοίκηση Τομέα Δημόσιας Υγείας,

M.B.A.,

Οικονομική Περιφερειακή Ανάπτυξη,

Οικονομικά του Περιβάλλοντος,

Οργάνωση και Διοίκηση Βιομηχανικών Συστημάτων,

Οργάνωση και Διοίκηση Υπηρεσιών Υγείας.

3. Μηχανικών Ηλεκτρονικών Υπολογιστών και Πληροφορικής, για:

Βιοϊατρική Τεχνολογία,

Επιχειρηματική Πληροφορική,

Ηλεκτρονική Μάθηση,

Κρυπτογραφία - Ασφάλεια Επικοινωνιών και Δικτύων,

Μικροσυστήματα & Νανοδιατάξεις - Ρομποτική,

Νοήμονα Συστήματα,

Παραγωγή & Διαχείριση Ενέργειας,

Πληροφορική Επιστημών Ζωής,

Συστήματα Υπολογιστών,

Σχεδίαση Ολοκληρωμένων Κυκλωμάτων,

Τεχνολογία Λογισμικού,

Τεχνολογίες Πληροφοριών και Επικοινωνιών στην Εκπαίδευση.

4. Περιβαλλοντικών Επιστημών,

Χωρίς περιορισμό πεδίων μεταπτυχιακού

5. Μαθηματικών, Εφαρμοσμένων Μαθηματικών, Στατιστικής, Φυσικής, Χημείας, Φαρμακευτικής, για:

Αναλογιστικά,

Βιοστατιστική,

Βιοχημεία,

Διαχείριση Περιβαλλοντικών Θεμάτων με Επιπτώσεις στην Υγεία,

Ιατρική Φυσική - Ιατρική Τεχνολογία,

Κλινική Χημεία,

Νανοεπιστήμες και Νανοτεχνολογία,

Νανοτεχνολογία και Ρομποτική,

Στατιστική και Επιχειρησιακή Έρευνα,

Στοχευμένη Ανάπτυξη Φαρμάκων,

Φυσική Περιβάλλοντος.

6. Ιατρικής, για:

Αναγεννητική Ιατρική,

Ανοσολογία,
Βιοστατιστική,
Διαταραχές Ανοσοποιητικού Συστήματος,
Διοίκηση Υπηρεσιών Υγείας,
Ενδοκρινολογία,
Επεμβατική Ακτινολογία,
Επεμβατική Πνευμολογία,
Επιστήμες του Εγκεφάλου και του Νου,
Επιστήμη της Διατροφής και Διαιτολογίας (Για τη συγκεκριμένη ειδίκευση μπορούν
επίσης να υποβάλλουν αιτήσεις και πτυχιούχοι ή τελειόφοιτοι τμημάτων ΑΕΙ σχετικών
με τις επιστήμες της Διαιτολογίας - Διατροφής),
Ιατρική Γενετική,
Ιατρική Φυσική - Ακτινοφυσική,
Καρδιαγγειακά Νοσήματα,
Μικροχειρουργική,
Μοριακή Ιατρική - Προηγμένη Μοριακή Διαγνωστική,
Ογκολογία,
Προληπτική & Κοινωνική Ιατρική,
Ρομποτική Χειρουργική - Τηλεχειρουργική,
Φυσιολογία.

**7. Αρχιτεκτόνων Μηχανικών, Αγρονόμων & Τοπογράφων Μηχανικών, Μηχανικών
Χωροταξίας & Πολεοδομίας, για:**

Αστικό Σχεδιασμό,
Αρχιτεκτονική Τοπίου,
Βιοκλιματικός Σχεδιασμός,
Βιωσιμότητα στον Αρχιτεκτονικό Σχεδιασμό & Υγιή Κτίρια,
Ευφυή Κτίρια & Αρχιτεκτονική,
Περιβάλλον και Ανάπτυξη,
Πολεοδομικό και Χωροταξικό Σχεδιασμό,
Προστασία Μνημείων.
Σύγχρονα Δομικά Υλικά & Συστήματα (Ασφάλεια & Υγιεινή Κτιριακού
Περιβάλλοντος),
Τεχνολογία Οικοδόμησης,
Φυσικό Φωτισμό/Αερισμό στην Αρχιτεκτονική.

8. Πολιτικών Μηχανικών, για:

Αντισεισμική Τεχνολογία,
Αποκατάσταση Κατασκευών (Επισκευή - Συντήρηση),
Γεωτεχνική & Περιβαλλοντική Μηχανική,
Γεωτεχνική Σεισμική Μηχανική,
Δομοστατικό Αντισεισμικό Σχεδιασμό Τεχνικών Έργων,
Μηχανική Μεταφορών,
Οργάνωση & Διοίκηση Τεχνικών Συστημάτων,
Προστασία Περιβάλλοντος και Βιώσιμη Ανάπτυξη.

9. Μηχανολόγων και Ναυπηγών Μηχανικών, για:

Βιοϊατρική Τεχνολογία,
Διοίκηση Παραγωγικών Συστημάτων,
Μηχανική Μεταφορών,
Μικροσυστήματα & Νανοδιατάξεις,
Παραγωγή & Διαχείριση Ενέργειας,
Συστήματα Αυτομάτου Ελέγχου & Ρομποτικής,

Σχεδιασμό Βιομηχανικών Εγκαταστάσεων,
Τεχνολογία και Μηχανική Περιβάλλοντος
Τεχνολογία Προηγμένων Υλικών.

10. Χημικών Μηχανικών, Μηχανικών Μεταλλείων Μεταλλουργών, Μηχανικών Διαχείρισης Ενεργειακών Πόρων, για:

Ενέργεια & Περιβάλλον,
Επιστήμη & Τεχνολογία Υλικών,
Μεταλλουργία Σιδήρου - Χάλυβα,
Νανοτεχνολογία,
Οργάνωση και Διοίκηση Βιομηχανικών Συστημάτων,
Παραγωγή & Διαχείριση Ενέργειας,
Περιβαλλοντική Μηχανική,
Στοχευμένη Ανάπτυξη Φαρμάκων.

Οι Πτυχιούχοι Α.Ε.Ι. όλων των παραπάνω επιστημονικών κλάδων μπορούν να υποβάλλουν στο Ίδρυμα αίτηση για υποτροφία για τη λήψη πτυχίου MBA. Γενικές προϋποθέσεις χορηγήσεως των υποτροφιών ορίζονται:

1. Οι υποψήφιοι να είναι Έλληνες την ιθαγένεια ή το γένος.
2. Η περιορισμένη οικονομική δυνατότητα των υποψηφίων για να αντιμετωπίσουν μεταπτυχιακές σπουδές.
3. Η γνώση της γλώσσας της χώρας, στην οποία επιθυμούν να σπουδάσουν. Η γνώση αυτή να προκύπτει από το πτυχίο Proficiency ή TOEFL με 80 ή 213 ή 550 τουλάχιστον μονάδες, IELTS 6,5 για τις Αγγλόφωνες χώρες, το Superieur III ή Sorbonne II για Γαλλόφωνες χώρες και το Mittelstufe II με άριστα για Γερμανόφωνες χώρες.
4. Ο μέσος όρος βαθμολογίας των μαθημάτων των ετών σπουδών για τον τελειόφοιτο καθώς και ο βαθμός πτυχίου για τον πτυχιούχο να είναι τουλάχιστον 8 για όλες τις Σχολές των Ελληνικών Πανεπιστημίων, η αναφορά Bien (16/20) για τα Γαλλικά Πανεπιστήμια, First Class Honours, για τα Αγγλικά Πανεπιστήμια, 3,2 μόρια στα 4 για τα Αμερικανικά Πανεπιστήμια και Sehr Gut (1.5) για τα Γερμανικά Πανεπιστήμια.
5. Η ηλικία των υποψηφίων να μην είναι μεγαλύτερη των 30 ετών, δηλ. οι γεννηθέντες μετά την 31.12.1980.

Ιατροί και τελειόφοιτοι της Ιατρικής μπορούν να υποβάλλουν αίτηση για λήψη υποτροφίας προκειμένου να πραγματοποιήσουν είτε μεταπτυχιακές σπουδές, είτε συγκεκριμένη έρευνα σε Νοσοκομείο ή Ερευνητικό Κέντρο που έχουν εξασφαλίσει θέση.

Σε καμία περίπτωση οι ιατροί δεν μπορούν να χρησιμοποιούν τον χρόνο της υποτροφίας για τη λήψη ειδικότητας.

Οι υποτροφίες χορηγούνται μόνον για σπουδές πλήρους παρακολούθησης. Αιτήσεις για σπουδές μερικής παρακολούθησης ή εξ αποστάσεως δεν γίνονται δεκτές. Οι υποψήφιοι μπορούν να υποβάλλουν αίτηση για μία μόνο ειδίκευση.

Προθεσμία κατάθεσης των αιτήσεων ορίζεται η 15 Φεβρουαρίου 2011, μετά την οποία καμμία αίτηση δεν θα γίνει δεκτή.

- Η κατάθεση των αιτήσεων γίνεται από τον ίδιο τον υποψήφιο, με αντιπρόσωπο ή ταχυδρομικά (όχι με το ηλεκτρονικό ταχυδρομείο).
- Οι αιτήσεις θα γίνονται δεκτές μόνο, εφ' όσον είναι συμπληρωμένες χωρίς καμμία παράλειψη και συνοδεύονται από ΟΛΑ τα δικαιολογητικά, τα οποία αναφέρονται στο σχετικό ενημερωτικό σημείωμα.

Οι ενδιαφερόμενοι μπορούν να παραλάβουν τα σχετικά έντυπα από τη Γραμματεία του

Ιδρύματος (Λεωφ. Βασ. Σοφίας 23Α, 3ος όροφος) τις εργάσιμες ημέρες και από ώρα 10 έως 12 π.μ. ή από το Διαδίκτυο στη Δ/ση www.bodossaki.gr

GRADUATE OPPORTUNITIES - NOVEL COSMOGENIC APPROACHES FOR SURFICIAL PROCESSES AND QUATERNARY GEOLOGY - PURDUE UNIVERSITY - PRIME LAB

The new in situ cosmogenic ^{14}C laboratory at Purdue University's PRIME Lab is seeking motivated new Ph.D. students interested in developing applications of in situ cosmogenic ^{14}C (in situ ^{14}C) for surficial process and Quaternary geologic studies. In situ ^{14}C is produced by cosmic rays incident on terrestrial materials in a manner similar to other commonly measured in situ cosmogenic nuclides such as ^{10}Be or ^{26}Al . However, its significantly shorter half-life enables one to explore surface processes in ways previously unavailable using only long-lived or stable cosmogenic nuclides. In particular, we are looking for students interested in studying Holocene glacial chronologies and/or rapid surface processes.

Purdue is a major research-extensive university in north-central Indiana that is well known internationally as a center for innovative research involving cosmogenic nuclide methods. Our research community includes several faculty and a highly productive group of graduate students across earth sciences and physics. PRIME Lab (the Purdue Rare Isotope Measurement Laboratory) is a dedicated national accelerator mass spectrometry (AMS) facility funded by NSF, NASA and NIH.

Funded graduate assistantships are available, and applicants must have research experience (M.S. preferred) and strong quantitative and writing skills. For more information contact Dr. Nat Lifton (nlifton@purdue.edu; <http://www.purdue.edu/eas/people/faculty/lifton.php>). Purdue University is an Equal Opportunity/Equal Access/Affirmative Action employer fully committed to achieving a diverse student body.

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ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

NARNIA: NEW ARCHAEOLOGICAL RESEARCH NETWORK FOR INTEGRATING APPROACHES TO ANCIENT MATERIAL STUDIES

A Marie Curie Initial Training Network – Proposal Number 265010 Call: FP7-PEOPLE-2010-ITN

NARNIA is an interdisciplinary project, the main objective of which is to provide young researchers with the means to conduct research on ancient Eastern Mediterranean material culture and to develop their analytical skills through a series of research and training activities.

An awareness of the recent advances in technology and an understanding of the implications for theory and practice in the heritage environment have brought together a consortium of academic institutions (The University of Cyprus, University College London, The University of Sheffield, Vrije Universiteit Brussel, Université Paris-Ouest, and The Hashemite University), a Research Institute (National Centre for Scientific Research “Demokritos”) and two private enterprises (G.M EUROCY INNOVATIONS LTD and Thetis Authentics LTD) in this collaborative project to support young researchers in their first steps into the competitive and complementary worlds of academia and private enterprise.

This well-structured research network aims to improve the career prospects of employment for young researchers, developing their lab-based skills in the study of ancient materials, while contributing to the history and archaeology of the Eastern Mediterranean basin, a region of great historical, cultural and geopolitical significance.

In particular, through a comprehensive mobility scheme, young researchers will have the opportunity to continue their research careers at high profile universities and well-established private enterprises while working in research projects focused on the study of ancient material culture.

Sixteen ESR (Doctoral) and three ER (Post Doctoral) Fellows will be trained to integrate theory and archaeological sciences for the study of different material categories, including ceramics, metals, glass and mosaics from primarily Cyprus, Greece and Jordan.

The proposed program engages experienced academic and research staff, young entrepreneurs, and young researchers for a broad collaboration network, which will facilitate the exploration of analytical equipment and research data, while concurrently directing and promoting research activities in Eastern Mediterranean countries.

For more information see:

<http://www.ucy.ac.cy/data/archreun/narnia%20information.pdf>

Project Coordinator

Associate Professor Vasiliki Kassianidou, Department of History and Archaeology,
University of Cyprus

Contact: v.kassianidou@ucy.ac.cy

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tel. 357 22 893564
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<http://www.ucy.ac.cy/~arkasian.aspx>

EU-FUNDED ANALYSIS CALL

Dear All,

There is a call out now from the Budapest Neutron Centre, with a deadline of 15 February 2011, for European Union funded analysis of archaeological and museum objects under the FP7 CHARISMA programme. The BNC are world leaders in prompt gamma neutron activation analysis. There are a number of other techniques available and facilities participating under the CHARISMA programme as well. They are offering to pay travel, accommodation, and the costs of the analysis for up to 2 group members per proposal, so long as the lead researcher and the majority of the group are based in either an EU country, or an 'associated State'. There a list of those countries in the Call, and it includes Turkey and Israel for example.

There is a downloadable copy of the Call document here:
http://www.icon.org.uk/images/stories/eu_charisma_call.doc

Cheers,

Evelyne

INTERNET SITES

ARCHAEO+MALACOLOGY GROUP **NEWSLETTER**

The Archaeo+Malacology Group Newsletter - A Brief Introduction

The Archaeomalacology Group was formed indirectly as the result of a talk I gave to fellow members of the Conchological Society of Great Britain and Ireland at the Natural History Museum in London in February 2000. Having worked as an archaeomalacologist, albeit on a freelance and very part time basis, for nearly 25 years in almost total isolation, it came as a revelation to me that there were others out there with similar interests! It therefore seemed a good idea to try to establish a forum where archaeomalacologists could air their views, exchange information and above all make contact with others working in similar subject areas.

The first issue of the AMG Newsletter appeared in July 2001 and consisted of the names, contact details and research interests of the thirty-two people who had responded to a notice I published in *The Conchologists' Newsletter* (No. 154: 385, September 2000). Since then the list has expanded to include around 80 members. Further issues have appeared at approximately six-monthly intervals, and have included short articles, research notes, abstracts of publications, notices of meetings, requests for information, and so on.

The ICAZ Archaeomalacology Working Group was then set up as a result of the one-day archaeomalacology session held at the ICAZ Conference in Durham in August 2002. It was obvious that the AMG Newsletter and the ICAZ Group were aimed at the same audience, and it seemed sensible to join forces. The ICAZ Archaeomalacology Working Group has therefore kindly agreed to host the AMG Newsletter on their new website, starting with issue number 5. It is hoped to add the four previous issues at a later date, and future issues are scheduled for March and September each year.

Contributions for future issues are warmly invited. Let's make the most of this opportunity!

Please visit the site: http://triton.anu.edu.au/archaeo+malacology_newsletter.htm

POXY: OXYRHYNCHUS ONLINE

A guide and [online database](#) for the Oxyrhynchus Papyri.

Please visit the site: <http://www.papyrology.ox.ac.uk/POxy/>

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

ARCHAEOLOGY, UNIVERSITY OF OXFORD, VOLUME 53, ISSUE 1 PAGE 1 - 214

The latest issue of Archaeology is available on Wiley Online Library

Original Articles

A STUDY OF OBSIDIAN SOURCE USAGE IN THE CENTRAL ANDES OF ARGENTINA AND CHILE (pages 1–21) M. GIESSO, V. DURÁN, G. NEME, M. D. GLASCOCK, V. CORTEGOSO, A. GIL and L. SANHUEZA Article first published online: 16 DEC 2010 | DOI: 10.1111/j.1475-4754.2010.00555.x

MATERIAL CHARACTERIZATION OF CERAMIC TILE MOSAIC FROM TWO 17TH-CENTURY ISLAMIC MONUMENTS IN NORTHERN INDIA (pages 22–36) MANINDER SINGH GILL and THILO REHREN Article first published online: 6 MAY 2010 | DOI: 10.1111/j.1475-4754.2010.00537.x

LEAD ISOTOPIC ANALYSIS FOR THE IDENTIFICATION OF LATE BRONZE AGE POTTERY FROM HALA SULTAN TEKKE (CYPRUS) (pages 37–57) V. RENSON, J. COENAERTS, K. NYS, N. MATTIELLI, F. VANHAECKE, N. FAGEL and PH. CLAEYS Article first published online: 14 APR 2010 | DOI: 10.1111/j.1475-4754.2010.00535.x

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NEW BOOK ON GLASS ARCHAEOLOGY

A new book on glass archaeology has just appeared. The book is available both in printed and electronic pdf form. The editor is responsible for its distribution. Each papers in pdf format are available separately. Here is its detailed description:

E. LAFLI (ed.), *Late Antique/Early Byzantine Glass in the Eastern Mediterranean. Colloquia Anatolica et Aegaea – Acta congressus communis omnium gentium Smyrnae II/Dokuz Eylul University, Faculty of Arts, Department of Archaeology, Division for Medieval Archaeology, Publication Series, No. 1. Izmir, Hurriyet Matbaasi 2009. ISBN 978-605-61525-0-4. 1st Edition (500 samples). 34 papers with xx+403 pages and numerous black-white figures. Conference papers and abstracts, presented at the International Colloquium, “Late Antique Glass in Anatolia (4th to 8th cent. A.D.)”, in October 25–28, 2009 in Izmir, Turkey. All papers are in English, with the exception of two contributions in German; abstracts and key words in English, German, Turkish, and Italian. 21,5 x 28,7 cm; paperback; 80 gr. quality paper.*

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THE POWER OF TECHNOLOGY IN THE BRONZE AGE EASTERN MEDITERRANEAN, ANN BRYLSBAERT

Mediterranean: The Case of the Painted Plaster. Monographs in Mediterranean Archaeology 12. London/Oakville: Equinox, 2008. Pp. xiv, 258; figs. 36; tables 28. ISBN 9781845534332. \$100.00.

Reviewed by Hariclia Brecolaki, Centre for Greek and Roman Antiquity (KERA), The National Research Foundation, Athens (hbrek@eie.gr)

This book is based on the author's dissertation (University of Glasgow 2004) and on her recent papers about the materials and techniques of Bronze Age wall paintings. While the title emphasizes the 'power of technology in the Bronze Age eastern Mediterranean', the originality of the book relies on its subtitle, the 'painted plaster', where the author has to offer first-hand observations. As claimed in the introduction, Brylsbaert's prime interest is to provide new insights into the whole tissue of interaction between human and social agency, technological production, and the transfer of knowledge within the eastern Mediterranean, through a multidisciplinary approach.

Furthermore, the author argues that her present work combines issues of iconography, technology and style, moving a step forward from the traditional stylistic and iconographic studies.

The volume is structured in two parts. Part I (chapters 1 to 4) offers the theoretical and methodological background of the study by assembling existing ideas on the craft specialization in the Late Bronze Aegean and eastern Mediterranean, with an emphasis on the suggested role of the artisans, on the different stages of production, their organization in groups and their 'social identities'. Part II (chapters 5 to 8) is dedicated to the presentation of her experimental work and the archaeometric results as they pertain to painted plaster samples, the subsequent interpretation of which leads the author to propose a transfer of technological knowledge from west to east, diverging from the established east-west influence of iconographic motifs. What creates some confusion in the structure of the book is that the author anticipates discussions in Part I that should have normally been developed after the demonstration of the results provided by her case study, in Part II. Consequently, there are several overlapping discussions and the reader should be prepared to skip back and forth between the various chapters for a complete picture.

In her first chapter "A Tale of Frescoes" (pp. 1-14), Brylsbaert presents a broad overview of the research conducted so far in the field of Bronze Age wall painting studies; however, there are cases where the bibliography needs to be updated and there are several technological studies missing, as already indicated by A. M. Meier.¹

In chapter 2, "The Power of Technology, Knowledge and Social Agency" (pp. 15-44), the author emphasizes how our understanding of the role of 'human action' may shed more light on questions regarding personal motivation and technological transfer. The

discussion moves on to the social organization of the artisans and their identities, relying mostly on previous works dealing with interconnections between crafts, society and craftsmen's mobility within an eastern Mediterranean koine. 'Traditional' questions, such as the estimation of the artisans' full-time or part-time work, their attachment to elites or their independent status, and the transmission of their knowledge over time, are further ramified.

The third chapter, "Technological style and the Power of Technology and Knowledge" (pp. 45-51), stresses the necessity of combining issues of iconography, technology and style in order to appreciate the production of wall paintings in a holistic way.

In chapter 4, "Archaeometric Approaches to Technologies and Materials" (pp. 52-76), Brysbaert discusses the methodology followed both for the technological examination of the painted plaster and replication work. The author also describes the instrumental and analytical techniques on which she relied for the identification of the painting materials.

In her fifth chapter "Painted Plaster in the Aegean and Eastern Mediterranean" (pp. 77-110), Brysbaert provides for each site useful information above archaeological contexts and the importance of the examined material. The author tackles the role of painted plaster in the Eastern Mediterranean, underlining its primary technological and practical aspect.

Chapter 6, "Analyzed to Bits: Technological and Iconographic Transfer" (pp. 111-146), considers results obtained through the scientific investigation of painted plaster samples, by dividing them into six sections, according to the method of analysis employed. Although most of the results in this chapter are already known from the author's previous works, it is very convenient to have them assembled together here.

In chapter 7, "Considering Material Culture and Social Identities" (pp. 147-185), Brysbaert attempts to interpret more thoroughly the data presented in the previous chapter and to demonstrate that the direction of technological transfer is from west to east, heavily relying on the assumption that the use of a fresco technique was practiced in the east (at Tell el-Dab'a).

Finally, chapter 8 "Technology and Social Agency of Painted Plaster" (pp. 186-198), seeks to place this study in its broader context and to illuminate the importance of technology and trade in the Late Bronze Age eastern Mediterranean. The author emphasizes the elite context of the examined wall paintings, in and outside the Aegean, and the importance of elite gift-giving during the Middle and Late Bronze Age in the broader eastern Mediterranean.

The most original aspects in Brysbaert's work are both her personal involvement in the in situ selection and analysis of painted plaster samples, and their wide-ranging provenance from 16 sites on Crete (Knossos, Palaikastro, Monastiraki, Myrtos-Pyrgos), the Cyclades (Phylakopi), the Greek mainland (Mycenae, Tiryns, Thebes, Gla, Orchomenos) and the eastern Mediterranean (Alalakh, Hattusha, Qatna, Tell Sakka, Tel Kabri, Tell el-Dab'a), covering a wide chronological span and allowing for comparisons regarding technological achievements and cross-cultural contacts. There are, however, some problems which need to be pointed out.

While Brysbaert stresses the ‘strongly interdisciplinary approach’ in her work, she has done no analysis intended to detect organic substances that could provide evidence for a secco painting techniques. The author’s argumentation (p. 56-57 and 119) that traces of organic binding media do not survive and may not be recognized by current scientific methods of investigation such as GC-MS (Gas Chromatography – Mass Spectrometry) is no longer the case. The results of recent publications of wall paintings from both Egypt² and the Greek mainland³ have securely demonstrated that a secco painting techniques were employed during the Bronze Age, using egg, animal glue and vegetable gums (tragacanth and fruit tree gums) as binders.

In the ‘sampling strategy’ we may detect an inconsistency with the book’s overall aim. Although the author is constantly supporting the intersection between iconography, style and technology, she has chosen to examine samples on the strict basis of their physical colour, and structure, without any consideration of their iconographic context and artistic style. Brysbaert’s argument for doing this is based on the obvious reasoning that no samples should be taken from areas where iconographic elements are preserved. However, the major advantages of recent non-destructive analytical techniques (XRF, XRD, RAMAN, FTIR) rely precisely on the possibilities they offer to make unlimited numbers of analyses on the surface of the wall paintings, without causing the slightest damage. We do, therefore, have the potential to broaden our technical investigations by identifying pigments within specific pictorial compositions and then further to speculate about the choice and value of materials and colours within their social contexts.

In her pigment analysis I would like to draw attention on a few points of particular interest. The common gamut of pigments (including calcite for the whites, carbon black, iron based ochres for yellow and red hues, and Egyptian blue) is further enriched with additional pigments: riebeckite, pyrolusite and green earth, whose choice must have been related to their local provenance, and a few unusual pigments including lapis lazuli and an organic purple. The author’s observations about the composition of Egyptian blue are particularly interesting: she convincingly demonstrates that the percentage of tin content in copper indicates that recycled ‘bronze’ scraps were used as a source for the copper in the Egyptian blue samples she examined, and that this evidence may further support the notion that this pigment was produced in the Aegean (pp. 134-139). Chronological outlines for the use of riebeckite (a dark blue iron-containing variety from the family of alkali amphiboles which occur in metamorphic rocks) are also interesting, but the author includes in her discussion results that are uncertain, such as the presence of riebeckite in samples from the Greek mainland. Furthermore, the use of riebeckite at Miletus may not necessarily form ‘a great indicator for material transfer’ (p. 134), since blue amphiboles are present in sediments of the southern coast and northwest Turkey.⁴

The most potentially exciting analytical result is the identification of grains of lapis lazuli within a purple paint layer from Gla (p. 133). It is a pity, though, that the author does not discuss more extensively such an extraordinary case and does not provide an adequate photographic documentation of the paint layer. Indeed, the fact that lapis lazuli was detected only in grains within a mixture of hematite and a purple organic pigment is puzzling. I wonder why and under which circumstances a Bronze Age painter would chose to include this expensive material within a mixture. Could the use of lapis within an artistic context have been somehow connected to the great number of Kassite lapis lazuli seals found in Thebes?

The author's assumption that the grain size of the pigments may be used as an indicator for connections between various sites, and also to suggest 'less labour' in the cases where pigments are coarser, is not convincing (pp. 151-152). Grain size is usually a function of the desired hue and a pigment's properties. On the contrary, the practice in both Knossos and Miletus of the uncommon mixture of riebeckite and hematite to produce purple may be used as an argument to suggest a possible transfer of knowledge, as the author maintains (p. 154).

In so far as the application of pigments is concerned, the author is convinced that the a fresco technique was the one broadly used and she believes that a secco painting was limited to additions only. Such an assumption, however, may not be sustained only by macroscopic observations and by stratigraphic study of cross sections. Further analytical investigation using chromatographic techniques is required in order to prove the extent of the fresco technique on the examined wall paintings, since the author is using as her major argument the practice of a fresco in Eastern Mediterranean wall paintings to support the transfer of technology from west to east.

To conclude: this book assembles a great deal of information about the technology of wall paintings during the second millennium B.C. in the Aegean and the eastern Mediterranean (the reader would, however, have wished to find a more generous and higher quality set of illustrations). Furthermore, the problems Brysbaert poses are stimulating and, although not always treated in depth, she proposes original ways of approaching a more inclusive study of ancient wall paintings.

The book is rounded out with a glossary and a general index.

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**PALAEOENVIRONMENTS AND SITE
FORMATION PROCESSES AT THE
NEOLITHIC LAKESIDE SETTLEMENT
OF DISPILIO, KASTORIA, NORTHERN
GREECE, GEOARCHAEOLOGY: AN
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Dispilio is a lakeside settlement by the Orestias Lake, Kastoria, northern Greece. The site was inhabited from the Middle Neolithic to the Chalcolithic, with some surface evidence of Bronze Age occupation. Microfacies analysis of the sediments, supported by a suite of environmental indices, has provided detailed paleoenvironmental data and elucidated the main processes involved in the formation of the site and its history of occupation. The settlement was established on the lakeshore, on a shallow sand ridge and a shore marsh. Initially, houses were built on raised platforms above the water. After a major conflagration, a range of depositional microenvironments were established that caused local changes in the sedimentation rate.

Therefore, some areas quickly emerged and became dry land, while some others continued to be flooded as part of the transitional supra-littoral environment. On the dry land, houses were built directly on the ground, whereas in the transitional areas houses continued to be built on raised platforms. Thus, gradually, a mound was formed and further shaped by subsequent lake-level fluctuations. One of the lake-level rises is tentatively related to the abandonment of the mound in the Chalcolithic and the development of a hardpan on its surface. There is also evidence of later occupation during the Bronze Age in the form of a few, mostly surface, archaeological remains.

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EΙΔΗΣΕΙΣ - NEWS RELEASE

NEANDERTHALS HAD A SWEET TOOTH, BY JENNIFER VIEGAS

Neanderthals had a sweet tooth and enjoyed cereals and other carbs, suggests a new study that analyzed food remains that were stuck on and between their teeth.

The study, published in the latest Proceedings of the National Academy of Sciences, adds to the growing body of evidence that Neanderthals weren't just spear-wielding carnivores. Earlier this year we told you that Neanderthals enjoyed some surf with their turf.

Now these latest findings, on 44,000- to 36,000-year-old Neanderthals from Iraq and Belgium, indicate Neanderthals were also eating dates, barley, legumes and possibly water lilies. (According to Survival IQ, the flowers, seeds and rhizomes of water lilies are all edible. Many are probably sprayed and full of pollutants now, so I don't recommend sampling them unless you're an expert on this sort of thing.)

Anthropologist Amanda Henry from the Center for Advanced Study of Hominid Paleobiology led the study. She and colleagues Alison Brooks and Dolores Piperno further determined that the barley had been cooked. It was either boiled or baked. Quite a few papers lately have described improved methods in making such determinations, based on the microstructure of the individual grains.

"Overall, these data suggest that Neanderthals were capable of complex food-gathering behaviors that included both hunting of large game animals and the harvesting and processing of plant foods," wrote Henry and her team.

They pointed out that dates and legumes have different harvest times, suggesting that Neanderthals "practiced seasonal rounds of collecting and scheduled returns to harvest areas."

The study could only look at very recent foods eaten by the Neanderthals, since the other food remains would likely have washed away or digested. Imagine if you dropped dead right now. What would scientists find on your teeth?

Some guesses can be made about what else Neanderthals ate, however, based on plant finds near their living areas -- in this case at Shanidar Cave in Iraq and Spy Cave in Belgium. At these sites the scientists found evidence for walnuts, chestnuts, relatives of chicory and lettuce, and relatives of modern culinary herbs. Prior research discovered that they also had access to acorns, cattails and pistachios.

In the past, some archaeologists argued that Neanderthals were not as food-savvy as modern humans, which could have led to their demise. This new study counters that claim, and instead strengthens the view that, as the authors wrote: "Neanderthal foraging patterns were much like those of modern humans, including small game, marine resources, plant foods, similar use of fire, some cooking, and other food processing."

What then happened to the Neanderthals? If you've been reading here for a while, you know my view is that they were mostly absorbed into the modern human population, but Neanderthals, as a species, went extinct about 30,000 years ago.

Please visit the site: <http://news.discovery.com/human/food-stuck-between-neanderthal-teeth-reveals-diet.html> [Go there for many nice pix]

SECRETS OF THE COLOSSEUM - A GERMAN ARCHAEOLOGIST HAS FINALLY DECIPHERED THE ROMAN AMPHITHEATER'S AMAZING UNDERGROUND LABYRINTH, BY TOM MUELLER

The floor of the colosseum, where you might expect to see a smooth ellipse of sand, is instead a bewildering array of masonry walls shaped in concentric rings, whorls and chambers, like a huge thumbprint. The confusion is compounded as you descend a long stairway at the eastern end of the stadium and enter ruins that were hidden beneath a wooden floor during the nearly five centuries the arena was in use, beginning with its inauguration in A.D. 80. Weeds grow waist-high between flagstones; caper and fig trees sprout from dank walls, which are a patchwork of travertine slabs, tufa blocks and brickwork. The walls and the floor bear numerous slots, grooves and abrasions, obviously made with great care, but for purposes that you can only guess.

The guesswork ends when you meet Heinz-Jürgen Beste of the German Archaeological Institute in Rome, the leading authority on the hypogeum, the extraordinary, long-neglected ruins beneath the Colosseum floor. Beste has spent much of the past 14 years deciphering the hypogeum—from the Greek word for “underground”—and this past September I stood with him in the heart of the great labyrinth.

“See where a semicircular slice has been chipped out of the wall?” he said, resting a hand on the brickwork. The groove, he added, created room for the four arms of a cross-shaped, vertical winch called a capstan, which men would push as they walked in a circle. The capstan post rested in a hole that Beste indicated with his toe. “A team of workmen at the capstan could raise a cage with a bear, leopard or lion inside into position just below the level of the arena. Nothing bigger than a lion would have fit.” He pointed out a diagonal slot angling down from the top of the wall to where the cage would have hung. “A wooden ramp slid into that slot, allowing the animal to climb from the cage straight into the arena,” he said.

Just then, a workman walked above our heads, across a section of the arena floor that Colosseum officials reconstructed a decade ago to give some sense of how the stadium looked in its heyday, when gladiators fought to their death for the public’s entertainment. The footfalls were surprisingly loud. Beste glanced up, then smiled. “Can you imagine how a few elephants must have sounded?”

Today, many people can imagine this for themselves. Following a \$1.4 million renovation project, the hypogeum was opened to the public this past October.

Trained as an architect specializing in historic buildings and knowledgeable about Greek and Roman archaeology, Beste might be best described as a forensic engineer.

Reconstructing the complex machinery that once existed under the Colosseum floor by examining the hypogeum's skeletal remains, he has demonstrated the system's creativity and precision, as well as its central role in the grandiose spectacles of imperial Rome.

When Beste and a team of German and Italian archaeologists first began exploring the hypogeum, in 1996, he was baffled by the intricacy and sheer size of its structures: "I understood why this site had never been properly analyzed before then. Its complexity was downright horrifying."

The disarray reflected some 1,500 years of neglect and haphazard construction projects, layered one upon another. After the last gladiatorial spectacles were held in the sixth century, Romans quarried stones from the Colosseum, which slowly succumbed to earthquakes and gravity. Down through the centuries, people filled the hypogeum with dirt and rubble, planted vegetable gardens, stored hay and dumped animal dung. In the amphitheater above, the enormous vaulted passages sheltered cobblers, blacksmiths, priests, glue-makers and money-changers, not to mention a fortress of the Frangipane, 12th-century warlords. By then, local legends and pilgrim guidebooks described the crumbling ring of the amphitheater walls as a former temple to the sun. Necromancers went there at night to summon demons.

In the late 16th century, Pope Sixtus V, the builder of Renaissance Rome, tried to transform the Colosseum into a wool factory, with workshops on the arena floor and living quarters in the upper stories. But owing to the tremendous cost, the project was abandoned after he died in 1590.

In the years that followed, the Colosseum became a popular destination for botanists due to the variety of plant life that had taken root among the ruins. As early as 1643, naturalists began compiling detailed catalogs of the flora, listing 337 different species.

By the early 19th century, the hypogeum's floor lay buried under some 40 feet of earth, and all memory of its function—or even its existence—had been obliterated. In 1813 and 1874, archaeological excavations attempting to reach it were stymied by flooding groundwater. Finally, under Benito Mussolini's glorification of Classical Rome in the 1930s, workers cleared the hypogeum of earth for good.

Beste and his colleagues spent four years using measuring tapes, plumb lines, spirit levels and generous quantities of paper and pencils to produce technical drawings of the entire hypogeum. "Today we'd probably use a laser scanner for this work, but if we did, we'd miss the fuller understanding that old-fashioned draftsmanship with pencil and paper gives you," Beste says. "When you do this slow, stubborn drawing, you're so focused that what you see goes deep into the brain.

Gradually, as you work, the image of how things were takes shape in your subconscious."

Unraveling the site's tangled history, Beste identified four major building phases and numerous modifications over nearly 400 years of continuous use. Colosseum architects made some changes to allow new methods of stagecraft. Other changes were accidental; a fire sparked by lightning in A.D. 217 gutted the stadium and sent huge blocks of travertine plunging into the hypogeum. Beste also began to decipher the odd marks and incisions in the masonry, having had a solid grounding in Roman mechanical engineering

from excavations in southern Italy, where he learned about catapults and other Roman war machines. He also studied the cranes that the Romans used to move large objects, such as 18-foot-tall marble blocks.

By applying his knowledge to eyewitness accounts of the Colosseum's games, Beste was able to engage in some deductive reverse engineering. Paired vertical channels that he found in certain walls, for example, seemed likely to be tracks for guiding cages or other compartments between the hypogeum and the arena. He'd been working at the site for about a year before he realized that the distinctive semicircular slices in the walls near the vertical channels were likely made to leave space for the revolving bars of large capstans that powered the lifting and lowering of cages and platforms. Then other archaeological elements fell into place, such as the holes in the floor, some with smooth bronze collars, for the capstan shafts, and the diagonal indentations for ramps. There were also square mortises that had held horizontal beams, which supported both the capstans and the flooring between the upper and lower stories of the hypogeum.

To test his ideas, Beste built three scale models. "We made them with the same materials that children use in kindergarten—toothpicks, cardboard, paste, tracing paper," he says. "But our measurements were precise, and the models helped us to understand how these lifts actually worked." Sure enough, all the pieces meshed into a compact, powerful elevator system, capable of quickly delivering wild beasts, scenery and equipment into the arena. At the peak of its operation, he concluded, the hypogeum contained 60 capstans, each two stories tall and turned by four men per level. Forty of these capstans lifted animal cages throughout the arena, while the remaining 20 were used to raise scenery sitting on hinged platforms measuring 12 by 15 feet.

Beste also identified 28 smaller platforms (roughly 3 by 3 feet) around the outer rim of the arena—also used for scenery—that were operated through a system of cables, ramps, hoists and counterweights. He even discovered traces of runoff canals that he believes were used to drain the Colosseum after it was flooded from a nearby aqueduct, in order to stage *naumachiae*, or mock sea battles. The Romans re-enacted these naval engagements with scaled-down warships maneuvering in water three to five feet deep. To create this artificial lake, Colosseum stagehands first removed the arena floor and its underlying wood supports—vertical posts and horizontal beams that left imprints still visible in the retaining wall around the arena floor. (The soggy spectacles ended in the late first century A.D., when the Romans replaced the wood supports with masonry walls, making flooding the arena impossible.)

Beste says the hypogeum itself had a lot in common with a huge sailing ship. The underground staging area had "countless ropes, pulleys and other wood and metal mechanisms housed in very limited space, all requiring endless training and drilling to run smoothly during a show. Like a ship, too, everything could be disassembled and stored neatly away when it was not being used." All that ingenuity served a single purpose: to delight spectators and ensure the success of shows that both celebrated and embodied the grandeur of Rome.

Beyond the thin wooden floor that separated the dark, stifling hypogeum from the airy stadium above, the crowd of 50,000 Roman citizens sat according to their place in the social hierarchy, ranging from slaves and women in the upper bleachers to senators and vestal virgins—priestesses of Vesta, goddess of the hearth—around the arena floor. A

place of honor was reserved for the editor, the person who organized and paid for the games. Often the editor was the emperor himself, who sat in the imperial box at the center of the long northern curve of the stadium, where his every reaction was scrutinized by the audience.

The official spectacle, known as the *munus iustum atque legitimum* (“a proper and legitimate gladiator show”), began, like many public events in Classical Rome, with a splendid morning procession, the *pompa*. It was led by the editor’s standard-bearers and typically featured trumpeters, performers, fighters, priests, nobles and carriages bearing effigies of the gods. (Disappointingly, gladiators appear not to have addressed the emperor with the legendary phrase, “We who are about to die salute you,” which is mentioned in conjunction with only one spectacle—a naval battle held on a lake east of Rome in A.D. 52—and was probably a bit of inspired improvisation rather than a standard address.)

The first major phase of the games was the *venatio*, or wild beast hunt, which occupied most of the morning: creatures from across the empire appeared in the arena, sometimes as part of a bloodless parade, more often to be slaughtered. They might be pitted against each other in savage fights or dispatched by *venatores* (highly trained hunters) wearing light body armor and carrying long spears. Literary and epigraphic accounts of these spectacles dwell on the exotic menagerie involved, including African herbivores such as elephants, rhinoceroses, hippopotamuses and giraffes, bears and elk from the northern forests, as well as strange creatures like onagers, ostriches and cranes. Most popular of all were the leopards, lions and tigers—the *dentatae* (toothed ones) or *bestiae africanae* (African beasts)—whose leaping abilities necessitated that spectators be shielded by barriers, some apparently fitted with ivory rollers to prevent agitated cats from climbing. The number of animals displayed and butchered in an upscale *venatio* is astonishing: during the series of games held to inaugurate the Colosseum, in A.D. 80, the emperor Titus offered up 9,000 animals. Less than 30 years later, during the games in which the emperor Trajan celebrated his conquest of the Dacians (the ancestors of the Romanians), some 11,000 animals were slaughtered.

The hypogeum played a vital role in these staged hunts, allowing animals and hunters to enter the arena in countless ways. Eyewitnesses describe how animals appeared suddenly from below, as if by magic, sometimes apparently launched high into the air. “The hypogeum allowed the organizers of the games to create surprises and build suspense,” Beste says. “A hunter in the arena wouldn’t know where the next lion would appear, or whether two or three lions might emerge instead of just one.” This uncertainty could be exploited for comic effect. Emperor Gallienus punished a merchant who had swindled the empress, selling her glass jewels instead of authentic ones, by setting him in the arena to face a ferocious lion. When the cage opened, however, a chicken walked out, to the delight of the crowd. Gallienus then told the herald to proclaim: “He practiced deceit and then had it practiced on him.” The emperor let the jeweler go home.

During the intermezzos between hunts, spectators were treated to a range of sensory delights. Handsome stewards passed through the crowd carrying trays of cakes, pastries, dates and other sweetmeats, and generous cups of wine. Snacks also fell from the sky as abundantly as hail, one observer noted, along with wooden balls containing tokens for prizes—food, money or even the title to an apartment—which sometimes set off violent scuffles among spectators struggling to grab them. On hot days, the audience might enjoy

sparsiones (“sprinklings”), mist scented with balsam or saffron, or the shade of the vela, an enormous cloth awning drawn over the Colosseum roof by sailors from the Roman naval headquarters at Misenum, near Naples.

No such relief was provided for those working in the hypogeum. “It was as hot as a boiler room in the summer, humid and cold in winter, and filled all year round with strong smells, from the smoke, the sweating workmen packed in the narrow corridors, the reek of the wild animals,” says Beste. “The noise was overwhelming—creaking machinery, people shouting and animals growling, the signals made by organs, horns or drums to coordinate the complex series of tasks people had to carry out, and, of course, the din of the fighting going on just overhead, with the roaring crowd.”

At the ludi meridiani, or midday games, criminals, barbarians, prisoners of war and other unfortunates, called damnati, or “condemned,” were executed. (Despite numerous accounts of saints’ lives written in the Renaissance and later, there is no reliable evidence that Christians were killed in the Colosseum for their faith.) Some damnati were released in the arena to be slaughtered by fierce animals such as lions, and some were forced to fight one another with swords. Others were dispatched in what a modern scholar has called “fatal charades,” executions staged to resemble scenes from mythology. The Roman poet Martial, who attended the inaugural games, describes a criminal dressed as Orpheus playing a lyre amid wild animals; a bear ripped him apart. Another suffered the fate of Hercules, who burned to death before becoming a god.

Here, too, the hypogeum’s powerful lifts, hidden ramps and other mechanisms were critical to the illusion-making. “Rocks have crept along,” Martial wrote, “and, marvelous sight! A wood, such as the grove of the Hesperides [nymphs who guarded the mythical golden apples] is believed to have been, has run.”

Following the executions came the main event: the gladiators. While attendants prepared the ritual whips, fire and rods to punish poor or unwilling fighters, the combatants warmed up until the editor gave the signal for the actual battle to begin. Some gladiators belonged to specific classes, each with its own equipment, fighting style and traditional opponents. For example, the retiarius (or “net man”) with his heavy net, trident and dagger often fought against a secutor (“follower”) wielding a sword and wearing a helmet with a face mask that left only his eyes exposed.

Contestants adhered to rules enforced by a referee; if a warrior conceded defeat, typically by raising his left index finger, his fate was decided by the editor, with the vociferous help of the crowd, who shouted “Missus!” (“Dismissal!”) at those who had fought bravely, and “Iugula, verbera, ure!” (“Slit his throat, beat, burn!”) at those they thought deserved death. Gladiators who received a literal thumbs down were expected to take a finishing blow from their opponents unflinchingly. The winning gladiator collected prizes that might include a palm of victory, cash and a crown for special valor. Because the emperor himself was often the host of the games, everything had to run smoothly. The Roman historian and biographer Suetonius wrote that if technicians botched a spectacle, the emperor Claudius might send them into the arena: “[He] would for trivial and hasty reasons match others, even of the carpenters, the assistants and men of that class, if any automatic device or pageant, or anything else of the kind, had not worked well.” Or, as Beste puts it, “The emperor threw this big party, and wanted the catering to go smoothly. If it did not, the caterers sometimes had to pay the price.”

To spectators, the stadium was a microcosm of the empire, and its games a re-enactment of their foundation myths. The killed wild animals symbolized how Rome had conquered wild, far-flung lands and subjugated Nature itself. The executions dramatized the remorseless force of justice that annihilated enemies of the state. The gladiator embodied the cardinal Roman quality of *virtus*, or manliness, whether as victor or as vanquished awaiting the deathblow with Stoic dignity.

“We know that it was horrible,” says Mary Beard, a classical historian at Cambridge University, “but at the same time people were watching myth re-enacted in a way that was vivid, in your face and terribly affecting. This was theater, cinema, illusion and reality, all bound into one.”

Tom Mueller’s next book, on the history of olive oil, will be published this fall. Photographer Dave Yoder is based in Milan.

Please visit the site: <http://www.smithsonianmag.com/history-archaeology/Secrets-of-the-Colosseum.html> [Go there for pix]

UNEARTHING PREHISTORIC TUMORS, AND DEBATE BY GEORGE JOHNSON

When they excavated a Scythian burial mound in the Russian region of Tuva about 10 years ago, archaeologists literally struck gold. Crouched on the floor of a dark inner chamber were two skeletons, a man and a woman, surrounded by royal garb from 27 centuries ago: headdresses and capes adorned with gold horses, panthers and other sacred beasts.

But for paleopathologists — scholars of ancient disease — the richest treasure was the abundance of tumors that had riddled almost every bone of the man's body. The diagnosis: the oldest known case of metastasizing prostate cancer.

The prostate itself had disintegrated long ago. But malignant cells from the gland had migrated according to a familiar pattern and left identifiable scars. Proteins extracted from the bone tested positive for PSA, prostate specific antigen.

Often thought of as a modern disease, cancer has always been with us. Where scientists disagree is on how much it has been amplified by the sweet and bitter fruits of civilization. Over the decades archaeologists have made about 200 possible cancer sightings dating to prehistoric times. But considering the difficulties of extracting statistics from old bones, is that a little or a lot?

A recent report by two Egyptologists in the journal *Nature Reviews: Cancer* reviewed the literature, concluding that there is “a striking rarity of malignancies” in ancient human remains.

“The rarity of cancer in antiquity suggests that such factors are limited to societies that are affected by modern lifestyle issues such as tobacco use and pollution resulting from industrialization,” wrote the authors, A. Rosalie David of the University of Manchester in England and Michael R. Zimmerman of Villanova University in Pennsylvania. Also on the list would be obesity, dietary habits, sexual and reproductive practices, and other factors often altered by civilization.

Across the Internet, news reports made the matter sound unequivocal: “Cancer Is a Man-Made Disease.” “Cure for Cancer: Live in Ancient Times.” But many medical experts and archaeologists were less impressed.

“There is no reason to think that cancer is a new disease,” said Robert A. Weinberg, a cancer researcher at the Whitehead Institute for Biomedical Research in Cambridge, Mass., and the author of the textbook “The Biology of Cancer.” “In former times, it was less common because people were struck down in midlife by other things.”

Another consideration, he said, is the revolution in medical technology: “We now diagnose many cancers — breast and prostate — that in former times would have remained undetected and been carried to the grave when the person died of other, unrelated causes.”

Even with all of that taken into account, there is a fundamental problem with estimating ancient cancer rates. Two hundred suspected cases may not sound like much. But sparsity of evidence is not evidence of sparsity. Tumors can remain hidden inside bones, and those that dig their way outward can cause the bone to crumble and disappear. For all the efforts of archaeologists, only a fraction of the human bone pile has been picked, with no way to know what lies hidden below.

Anne L. Grauer, president of the Paleopathology Association and an anthropologist at Loyola University of Chicago, estimates that there are roughly 100,000 skeletons in the world's osteological collections, and a vast majority have not been X-rayed or studied with more modern techniques.

According to an analysis by the Population Reference Bureau, the cumulative total of everyone who had lived and died by A.D. 1 was already approaching 50 billion, and had nearly doubled by 1750. (The analysis refutes the oft-made assertion that more people are alive today than have ever lived on earth.) If those figures hold, the number of skeletons in the archaeological database would represent barely one ten-thousandth of 1 percent of the total.

Within that minuscule sample, not all of the remains are complete. "For a long time archaeologists only collected skulls," said Heather J. H. Edgar, curator of human osteology at the Maxwell Museum of Anthropology at the University of New Mexico. "For the most part, there's no way to know what the rest of those people's skeletons might have said about their health."

So how are scientists to evaluate, for example, the significance of the handful of fossilized examples of osteosarcoma, a rare bone cancer that mostly affects young people? (What may be the oldest case was found in 1932 by the anthropologist Louis Leakey in a prehistoric relative of man.) Today the incidence of osteosarcoma among people younger than 20 is about five cases per million per year.

"You would need to screen 10,000 individuals to find a case," said Mel Greaves, a professor of cell biology at the Institute of Cancer Research in England, and the author of "Cancer: The Evolutionary Legacy" (Oxford, 2000). Not enough teenage remains have been scrutinized, he said, to draw a meaningful conclusion.

There is a further complication: more than 99 percent of cancers originate not in bone but in softer organs, which quickly decay. Unless they spread to bone, they will most likely go unrecorded.

Ancient mummies would seem to be an exception. But here, too, the pickings have been slim.

Only on rare occasions can pathologists get their hands on a comparatively recent mummy like Ferrante I of Aragon, king of Naples, who died in 1494. When his body was autopsied five centuries later, adenocarcinoma, which begins in glandular tissues, was found to have spread to the muscles of his small pelvis.

A molecular study revealed a typographical error in a gene that regulates cell division — a G had been flipped to A — which pointed to colorectal cancer. The cause, the authors speculated, might have been gluttonous consumption of red meat.

Over the years hundreds of Egyptian and South American mummies have turned up a few other cases. A rare tumor called a rhabdomyosarcoma was found on the face of a Chilean child who lived sometime between A.D. 300 and 600.

Dr. Zimmerman, co-author of the recent review, discovered a rectal carcinoma in a mummy dated between A.D. 200 and 400, and he confirmed the diagnosis with a microscopic analysis of the tissue — a first, he said, in Egyptian paleopathology.

“The fact remains that there are only a minute number of truly ancient mummies and skeletons that show evidence of cancer,” he said. “We just don’t find anything like the modern incidence of cancer.”

Although average life span was lower in ancient Egypt than it is today, Dr. Zimmerman argues that many individuals, especially the wealthy, lived long enough to get other degenerative diseases. So why not cancer?

Other experts have suggested that most tumors would have been destroyed by the invasive rituals of Egyptian mummification. But in a study published in 1977, Dr. Zimmerman showed it was possible for the evidence to survive.

In one experiment, he took the liver from a modern patient who had succumbed to metastatic colon cancer, dried it out in an oven and then rehydrated it — demonstrating, he said, that “the features of cancer are well preserved by mummification and that mummified tumors are actually better preserved than normal tissue.”

But as with skeletons, the problem remains: Given the small sample size, just how much cancer should scientists expect to see?

To get a rough idea, Tony Waldron, a paleopathologist at University College London, analyzed British mortality reports from 1901 to 1905 — a period late enough to ensure reasonably good records and early enough to avoid skewing the data with, for example, the spike in lung cancer caused in later decades by the popularity of cigarettes.

Taking into account variations in life span and the likelihood that different malignancies will spread to bone, he estimated that in an “archaeological assemblage” one might expect cancer in less than 2 percent of male skeletons and 4 to 7 percent of female skeletons.

Andreas G. Nerlich and colleagues in Munich tried out the prediction on 905 skeletons from two ancient Egyptian necropolises. With the help of X-rays and CT scans they diagnosed five cancers — right in line with Dr. Waldron’s expectations. And as his statistics predicted, 13 cancers were found among 2,547 remains buried in an ossuary in southern Germany between A.D. 1400 and 1800.

For both groups, the authors wrote, malignant tumors “were not significantly fewer than expected” when compared with early-20th-century England. They concluded that “the

current rise in tumor frequencies in present populations is much more related to the higher life expectancy than primary environmental or genetic factors.”

With so little to go on, archaeology may never have a definitive answer. “We can say that cancer certainly existed, and probably in somewhat lower frequency than it does today,” said Arthur C. Aufderheide, emeritus professor of pathology at the University of Minnesota and co-author of the Cambridge Encyclopedia of Human Paleopathology. That may be as certain as we ever can be.

As scientists continue to investigate, there may be comfort in knowing that cancer is not entirely civilization’s fault. In the normal course of life a creature’s cells must be constantly dividing — millions of times a second. Sometimes something will go wrong.

“Cancer is an inevitability the moment you create complex multicellular organisms and give the individual cells the license to proliferate,” said Dr. Weinberg of the Whitehead Institute. “It is simply a consequence of increasing entropy, increasing disorder.”

He was not being fatalistic. Over the ages bodies have evolved formidable barriers to keep rebellious cells in line. Quitting smoking, losing weight, eating healthier diets and taking other preventive measures can stave off cancer for decades. Until we die of something else.

“If we lived long enough,” Dr. Weinberg observed, “sooner or later we all would get cancer.”

Please visit the site:

http://www.nytimes.com/2010/12/28/health/28cancer.html?_r=1&hp

PYTHAGORAS, A MATH GENIUS? NOT **BY BABYLONIAN STANDARDS, BY** **LAURA ALLSOP FOR CNN**

Over 1,000 years before Pythagoras was calculating the length of a hypotenuse, sophisticated scribes in Mesopotamia were working with the same theory to calculate the area of their farmland.

Working on clay tablets, students would "write" out their math problems in cuneiform script, a method that involved making wedge-shaped impressions in the clay with a blunt reed.

These tablets bear evidence of practical as well as more advanced theoretical math and show just how sophisticated the ancient Babylonians were with numbers -- more than a millennium before Pythagoras and Euclid were doing the same in ancient Greece.

"They are the most sophisticated mathematics from anywhere in the world at that time," said Alexander Jones, a Professor of the History of the Exact Sciences in Antiquity at New York University.

He is co-curator of "Before Pythagoras: The Culture of Old Babylonian Mathematics," an exhibition at the Institute for the Study of the Ancient World in New York.

"This is nearly 4,000 years ago and there's no other ancient culture at that time that we know of that is doing anything like that level of work. It seems to be going beyond anything that daily life needs," he said.

Many scribes were trained in the ancient city of Nippur in what is now southern Iraq, where a large number of tablets were discovered between the mid-19th century and the 1920s.

Typical problems they worked on involved calculating the area of a given field, or the width of a trench.

These problems, says Jones, required the kind of math training taught to American Grade 10 students, but not in a format we would now recognize.

"It's not like algebra, it's all written out in words and numerals but no symbols and no times signs or equals or anything like that," he said.

This system, and the lack of recognizable Western mathematical symbols such as x and y, meant that it was several years before historians and archaeologists understood just what was represented on these tablets.

It took a young Austrian mathematician in the 1920s, named Otto Neugebauer, to crack the mathematical system and work out what the ancient Babylonians were calculating.

But despite his advances, it is only recently that interest in Babylonian math has started to take hold.

"I think that before Neugebauer and even after Neugebauer, there wasn't a lot of attention placed on mathematical training in Babylon even though we have this rich cuneiform history with the tablets," said Jennifer Chi, Associate Director for Exhibitions and Public Programs at Institute for the Study of the Ancient World.

One of the aims of the institute, she says, is to find interconnections between ancient cultures as well as look at what the institute sees as under-represented ancient cultures -- and the culture of ancient Babylonian math, she says, is ripe for popular revision.

"When we think of ancient mathematics, the first names that come to mind are Pythagoras and Euclid," she said, but that "this shouldn't be the case."

And though ancient Babylonia is often referred to in popular culture as a "lost" world, in fact much more evidence of mathematical learning from the period exists than from ancient Greece, said Chi.

Jones of New York University believes that there is much more that could be excavated but that, of course, current conditions in Iraq are not favorable. Still, there are enough tablets in collections across the world for mathematical historians to get stuck into.

For non-mathematicians, these tablets are a fascinating document of life in Mesopotamia. Most of the problems displayed are grounded in the everyday needs of ancient Babylonians.

But some tablets show the students engaging in what Jones calls "recreational math" -- math for math's sake.

"The only point of learning to do this kind of thing is really as a mental exercise, as a way of showing how smart you are," he said.

And it seems there is still more to learn from the Babylonians. Duncan Melville is a Professor of Mathematics at St. Lawrence University in Canton, New York, whose special interest is Mesopotamian mathematics.

According to Melville, teachers can continue to learn a thing or two about the way math was taught in Mesopotamia.

"You look at the way they set up their sequences of problems and it's all very carefully graduated, from simple problems to more complicated problems," he said.

"As a teacher of mathematics, it's very interesting to see how they organized their material," he continued. "There's still interesting things to learn from cutting-edge pedagogy 4,000 years ago."

With research continuing into this strand of ancient history, it remains to be seen whether Pythagoras's theorem will come to bear the name of an old Babylonian scribe instead

Please visit the site:

<http://www.cnn.com/2010/WORLD/meast/12/17/old.babylonian.math/> [Go there for nice pix]

8000 YEAR-OLD SUN TEMPLE FOUND IN BULGARIA

The oldest temple of the Sun has been discovered in northwest Bulgaria, near the town of Vratsa, aged at more than 8000 years, the Bulgarian National Television (BNT) reported on December 15 2010.

The Bulgarian 'Stonehenge' is hence about 3000 years older than its illustrious English counterpart. But unlike its more renowned English cousin, the Bulgarian sun temple was not on the surface, rather it was dug out from under tons of earth and is shaped in the form of a horse shoe, the report said.

The temple was found near the village of Ohoden. According to archaeologists, the prehistoric people used the celestial facility to calculate the seasons and to determine the best times for sowing and harvest. The site was also used for rituals, offering gifts to the Sun for fertility as BNT reported.

This area of Bulgaria was previously made famous because remnants of the oldest people who lived in this part of Europe were found.

Archaeologists also found dozens of clay and stone disks in the area of the temple.

"The semantics of the disks symbolise the disk of the Sun itself, which means that this is the earliest ever temple dedicated to the worship of the Sun God, discovered on our lands," archaeologist Georgi Ganetsovski told the BNT

Please visit the site:

http://www.sofiaecho.com/2010/12/15/1011502_archaeology-8000-year-old-sun-temple-found-in-bulgaria

ANCIENT COINS TEACH RESEARCHERS ABOUT MODERN SOCIETY

Researchers in classics and medical physics and applied radiation sciences have teamed up to analyze the metallic content of ancient coins in an effort to better understand Greek and Roman trade patterns and the development of modern society.

Sophisticated radiation techniques are being used to better understand ancient trade patterns and the development of modern society.

Spencer Pope, an archeologist who specializes in ancient Greece and assistant professor of classics, has teamed up with researchers in medical physics and applied radiation sciences to study the metallurgical content of Greek and Roman coins. By finding out what the coins are made of, says Pope, the researchers are able to reconstruct ancient trade routes, understand the development of economies and even determine the extent of counterfeiting. The work will also shine light on modern societies.

"The ancient world is a laboratory for understanding the societies of today," said Pope. "This research will help us link the archeological to the historical to understand how we, as a society, got to where we are today."

Twenty coins have already been analyzed using techniques including x-ray fluorescence systems at McMaster and a proton microprobe at the University of Guelph. After they are analyzed, radiation scientists are able to tell Pope what sorts of metal are present in the coins, allowing him to determine where they were minted and how widely they may have been circulated. He is also able to zero in on ancient economic downturns - during such times, coins were made with less valuable metals - and even track the collapse of the Roman Empire.

"What technique you use depends on what metals you're looking for," said Michael Farquharson, chair of the Department of Medical Physics and Applied Radiation Sciences. "So we use multiple systems to look for a number of metals - gold, copper, silver - present in the outer layer of the coins, then we use the McMaster Nuclear Reactor to penetrate deeper into the coin to determine whether or not the coin was plated with a different material than it was actually made of."

The systems used to analyze the coins have a number of other uses, including searching packages for explosive content and analyzing human tissue for the trace amounts of metal found in cancerous tumours, among other things.

The cross-campus collaboration between researchers in humanities and sciences is, according to Pope, one of the most interesting aspects of the project.

"By working together we can answer questions we wouldn't ordinarily be able to approach," he said. "It's a very exciting example of the sort of work a university can produce."

Provided by McMaster University

Please visit the site:

<http://www.physorg.com/news/2010-12-ancient-coins-modern-society.html>

MASSIVE CANADIAN MELT MAY HAVE TRIGGERED FLOOD OF BIBLICAL PROPORTIONS, BY RANDY BOSWELL

A British researcher has published a startling new theory that the remains of untold ancient settlements from a 100,000-year stretch of human history were submerged by the rapidly rising waters of the Persian Gulf around 6,000 BC — the result, in all likelihood, of a catastrophic, planetwide flood triggered in Canada.

There's a consensus among scientists that the collapse of a kilometres-high glacial dam at the end of the last ice age caused a massive outflow of meltwater into the Arctic or North Atlantic Ocean near Hudson Bay, generating a sharp rise in sea levels around the world and profoundly altering the Earth's climate.

Some scientists have even speculated that ancient myths about great floods — culminating in the biblical story of Noah's Ark — were inspired by the worldwide deluge.

But the new theory, advanced in the latest issue of the journal *Current Anthropology* by University of Birmingham archeologist Jeffrey Rose, offers the clearest picture yet of what may have been lost at the Middle East nexus of human civilization when Canada's super-sized Lake Agassiz — a remnant of which is today's Lake Winnipeg — suddenly burst its banks 8,000 years ago.

The resulting rise of the Indian Ocean flooded a Great Britain-sized expanse of the Arabian Peninsula that had previously been above water and was almost certainly inhabited by ancient peoples for as long as 100 millennia, Rose stated.

The rising water created the present-day Persian Gulf and drowned shorelines around the peninsula, along the northeast coast of Africa and elsewhere around the world.

And the flooding of those lands, Rose argued, would have submerged extensive archeological evidence of key moments in the evolution of the human race, of the initial stages of their eastward migration out of Africa, and of the cultural developments leading to the early civilizations of the Middle East.

Rose stated in a summary of the study that recent archeological discoveries along the Persian Gulf coast show relatively advanced cultures with no apparent precursor settlements to explain how they attained their level of cultural sophistication.

"These settlements boast well-built, permanent stone houses, long-distance trade networks, elaborately decorated pottery, domesticated animals, and even evidence for one of the oldest boats in the world," Rose noted.

"Perhaps it is no coincidence that the founding of such remarkably well-developed communities along the shoreline corresponds with the flooding of the Persian Gulf basin around 8,000 years ago," he added. "These new colonists may have come from the heart

of the Gulf, displaced by rising water levels that plunged the once fertile landscape beneath the waters of the Indian Ocean."

In an email to Postmedia News from Oman, Rose said further research into the precise timing and nature of the flood-triggering event that created the Persian Gulf is "an integral part of the puzzle."

He also referenced groundbreaking studies by University of Manitoba geologist James Teller, whose reconstructions of the colossal drainage of ancient Agassiz — the meltwater basin that once covered most of Central Canada, and held a volume equivalent to 15 Lake Superiors — have initiated a wave of new research on outburst impacts ranging from global climate cooling to the origins of agriculture in southern Europe.

"There is now a critical mass of evidence to indicate that some significant flooding event greatly impacted an indigenous group that had been living within the (Persian Gulf) basin," Rose said. "Whether this was a gradual process over a few thousand years, or, as Teller suggested, happened relatively quickly due to a (meltwater outburst) in the North Atlantic at 8,200 years before present, is one of the questions to be addressed going forward."

As early as 2004, Teller was tentatively linking the 6,000 BC Canadian gusher to flooding in the Persian Gulf region and the ancient flood story in the Epic of Gilgamesh, which scholars see as a possible model for the later biblical account of Noah's flood.

"Who knows how well the Epic of Gilgamesh or the Bible is really reflecting the real world," Teller told Postmedia News at the time. "But the floor of the Persian Gulf is really, really flat in the middle. And like dumping a cup of water on a table — or even a thimbleful — it will rush across the tabletop to the far end."

Rose, referring to recent archeological finds in Oman and Yemen, said there is now evidence suggesting a human presence in the southern part of the Arabian Peninsula as early as 100,000 years ago.

He noted that such a discovery "alters our understanding of human emergence and cultural evolution in the ancient Near East."

These and other findings, the summary stated, indicate that "vital pieces of the human evolutionary puzzle may be hidden in the depths of the Persian Gulf."

Please visit the site:

<http://www.canada.com/technology/Massive+Canadian+melt+have+triggered+flood+biblical+proportions/3954124/story.html>
