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ΚΑΛΗ ΧΡΟΝΙΑ 2014 - HAPPY NEW YEAR 2014

Newsletter of the Hellenic Society of Archaeometry

- January 2014 -

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ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

SESSION “POTTERY AS AN EXPERIMENT: SHIFTING AND ADAPTING PRODUCTION TECHNOLOGIES, FUNCTIONS AND STYLES” **- 20TH ANNUAL MEETING OF THE EUROPEAN ASSOCIATION OF ARCHAEOLOGISTS (EAA), ISTANBUL, SEPTEMBER 10-14, 2014**

Please circulate this email to any interested parties.

Dear Colleagues,

We are pleased to invite you to participate in the 20th Annual Meeting of the European Association of Archaeologists (EAA), which will be held in Istanbul on September 10-14, 2014 (<https://www.eaa2014istanbul.org/sayfa/19>). The EAA Annual Meetings have become the most important annual gathering for archaeologists from all over Europe and beyond, offering the unique opportunity to contribute to a continuing discussion concerning the numerous identities and contexts of European archaeology.

“Ancient technologies in Social Context” or the motive behind the emergence and the development of technologies is one of the several themes on which the EAA Istanbul 2014 Meeting is focused. Within this framework, it is our great pleasure to invite you to join the session “**Pottery as an experiment: shifting and adapting production technologies, functions and styles**”. The session is organized jointly by O. Cerasuolo (University of Buffalo – New York State University- USA), A. Ferrandes (Sapienza – University of Rome - Italy), M.C. Biella (University of Southampton, UK, and The British School at Rome, Italy) and M. Revello Lami (University of Amsterdam, the Netherlands). We aim at gathering a variety of studies (from Neolithic to Roman period across the ancient Mediterranean) which illustrate pottery production as an experimental and innovative phenomenon, with respect to technology, function and decoration. Please find attached the call for papers to read more about the theme of the session.

Prospective contributors are invited to submit abstracts of maximum 200 words. Please note that the deadline for submitting your abstract is January 27, 2014. Accepted language: English.

Participants will be notified of the EAA Scientific Committee’s decision via e-mail by February 18, in order to organize conference participation and travel arrangements (updated information available at <https://www.eaa2014istanbul.org/sayfa/27>).

We look forward to receiving your submission,

Sincerely

Orlando Cerasuolo

Dr. Orlando Cerasuolo, MA, PhD
Post-Doctoral Fellow
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**SUMMER SCHOOL COURSE: ANCIENT AND
HISTORIC METALS: TECHNOLOGY,
MICROSTRUCTURE, AND CORROSION,
UNIVERSITY OF SOUTHERN CALIFORNIA
(USC), 23-27 June, 2014**

Dear all,

I would be pleased if you would disseminate this notice to any interested students.

All the best,

David

David Scott
dascott@UCLA.EDU

SUMMER SCHOOL COURSE: ANCIENT AND HISTORIC METALS:
TECHNOLOGY, MICROSTRUCTURE, AND CORROSION, UNIVERSITY OF
SOUTHERN CALIFORNIA (USC), Monday 23rd June ? Friday 27th June 2014.

Summer School in Ancient and Historic Metals: 2014. To be held at:

The University of Southern California (USC). Course is limited to 10 participants only.

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

Artefacts for examination: Over the past 30 years an unrivalled collection of mounted metallographic samples has been assembled, which are studied as part of the course practical work, involving both polarized light microscopy and metallographic microscopy of both freshly polished and etched samples. These samples range from cast iron from China to wootz steel from India, bronze coinage alloys from the Roman Empire to high-tin bronze from ancient Thailand, silver alloys from the Parthian period to ancient Ecuador, gilded copper and tumbaga from Peru and Colombia, to mention only a few of the geographical areas covered by available samples. Course participants will be instructed in the use of polishing and etching in the examination of ancient metals and are encouraged to keep digital images of the samples they have prepared during the week. Students may also bring their own samples for examination if mounted and ground, or if

not mounted, then one or two samples may be brought which can be mounted and prepared during the course.

Course Instructor:

Professor David A. Scott, Founding Director of the MA program in Archaeological and Ethnographic Conservation at UCLA, 2003-2011, and Professor, Department of Art History.

His book, *Copper and Bronze in Art: Corrosion, Colorants, Conservation* won the prize from the Association of American Publishers as the best Scholarly/Art book published in the USA in 2002. Professor Scott has published over 115 papers in the peer-reviewed literature and is an Editor for the journal: *Studies in Conservation*.

Course Schedule: The course will be held over five days from Monday 23rd June to Friday 27th June. The course will be held at the Archaeological Research Center at the University of Southern California at the Ahmanson Center, Room ACB335 (ARC Lab) and Room ACB330 (Gallery Room) on the USC campus in Los Angeles from 9.15am to 5pm each day. More detailed directions will be distributed to course participants.

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

Course Costs: The cost of the instruction for the five days will be \$850.00. This cost also includes a free copy of the textbook for this course:

Ancient Metals: *Microstructure & Metallurgy Volume I: Copper and Copper Alloys*, published in 2013.

For details of payment and to register for this course, as well as to receive information concerning nearby hotels in the USC vicinity, please contact the course organizer and director:

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

Course Details:

Monday:

Introduction, use of the metallurgical microscope, the mounting and polishing of samples, their preparation, use of resins, grinding and polishing. Introduction to phase diagrams and their application. We will begin with the simple eutectic alloys of silver and copper and then progress to more complex phase diagrams to describe the alloying systems of copper-arsenical, copper-nickel, and copper-tin alloys. Casting and working of metals and aspects of bronze casting in the ancient world. Etching of some copper alloys. Recording of samples with digital camera and case studies in the examination of a group of copper alloy plaques and a bronze figurine of the God Osiris will be discussed.

Tuesday:

Continuation of the examination of copper-tin and copper-tin-lead alloys. Ancient coinage alloys of the Roman period, examination of copper-arsenic bronzes, aspects of the corrosion of bronze and copper alloys. The Pourbaix diagram and some of its applications in examination of the corrosion of metallic artefacts.

Wednesday:

The phase diagram for copper-silver and lead-tin alloys.

Examination of silver and debased silver alloys. Surface enrichment and corrosion. Problems in the authentication of ancient silver and bronze alloys. Metallographic examination of ancient silver alloys and techniques of etching silver.

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

Thursday:

Mounting of samples brought by students. Examination of some ternary phase issues in relation to gold-silver-copper alloys.

The corrosion of tumbaga alloys and aspects of the Pourbaix diagram. Video concerning the extraction of iron and steel.

Introduction to iron and steel. The principles of corrosion and the eight types of corrosion of metals. The examination of iron from meteorites. The technology of ancient iron and steel in the West, in India and in China will be contrasted and samples illustrating these different technologies examined. The metallography of ancient iron alloys.

Friday:

Corrosion issues of iron and steel. Weathering steel and patinas, the nature of iron corrosion products and their implications for the stabilization of iron artefacts during conservation treatments. Gold and gold alloys: gilding: examination of gold alloys.

Lecture on the technology of ancient gold alloys in South America. Continuation of laboratory work in the examination of mounted samples.

**6TH CONFERENCE OF THE
MEDITERRANEAN WORLDS SYMBOLS AND
MODELS OF THE MEDITERRANEAN,
UNIVERSITY OF CALABRIA, DEPARTMENT
OF HUMANITIES, SEPTEMBER 9-11, 2014**

The Mediterranean Sea is a milieu in which it is possible to observe, through an interdisciplinary lens, the undertaking of elements defining an idea which conflicts with its immediate sensitive aspect; an idea that arises from life situations and the imaginary world of every man. Nevertheless, it remains a context in which is possible to observe the presence and the constant use of historical symbols, patterns and models of those people inhabiting its shores, as embedded in both the artistic and material production, as well as in the literary one.

The Mediterranean Sea could be investigated as a real geographical and historical referee, that has generated, and continues to generate symbols; but it can be also interpreted as the metaphor and allegory of the “encounters and clashes” between near and distant people. There are symbols and models by which is possible to perceive and understand convergences and contacts, and disclose common identities, even when considering specific differences of the people.

The theme of this interdisciplinary conference will focus on these issues:

- The symbols (signs, gestures, objects, animals, persons) capable of bringing to mind meanings deeply interconnected with the development of each of Mediterranean society.
- The importance of tangible and intangible models serving as examples to reproduce and imitate the evidence that have marked and conditioned the life of the Mediterranean people from a political, religious, economic, and social viewpoints.

We welcome the submission of 250-word abstracts for twenty-minute papers that broadly address the above themes, and that may address, but not be limited by, the following topics:

- Symbols and models disclosing common identities
- Symbolical landmarks
- Symbols of the State and Political Power as institutional models
- Religious symbols
- Settlements patterns and historical-economic models
- Natural elements (living beings typical of the Mediterranean area bearing a symbolic value)
- Literary production as often recording the centrality of the Mediterranean as a complex and contradictory allegory
- Redefining Mediterranean boundaries as precarious and mobile limits, but also as bridges between lands and shores

- The metaphor of the Mediterranean and the dialectic between the hegemonic power of the centers and the potential destabilizing peripheries.

Abstract Submissions:

Abstracts should be no more than 250 words and should include at least 3 descriptive keywords, the presenter's name, email address, organization, and mailing address. The languages of the conference will be English and Italian.

Please send your abstract submissions to: m.salerno@unical.it, luca.zavagno@gmail.com

Deadline:

Abstract must be submitted by 1 March 2014 Notification of acceptance will be communicated by 1 April 2014.

Please visit the site: <http://medworlds6.altervista.org/call-papers/>

EARLY TEXTILES STUDY GROUP (ETSG),
CRAFTING TEXTILES FROM THE BRONZE
AGE TO AD 1600: A TRIBUTE TO PETER
COLLINGWOOD, 10-11 OCTOBER 2014,
LONDON

Franks Room, Wellcome Collection,
London, Euston Road NW1 2BE

Call for Papers

Peter Collingwood, a renowned weaver and master of textile structures, was a member of the ETSG Group until his death in 2008. As a tribute to his skills as a maker and innovator this conference will investigate some of the ancient techniques that fascinated him including tablet-weaving, braiding, sprang and rug-making.

Proposals are welcomed from academics, research students, museum curators, practitioners and independent scholars. Preference will be given to proposals that include images.

Please send one page abstract and brief CV by 31st January 2014 to:

Frances Pritchard
Textiles Department, Whitworth Art Gallery, The University of Manchester, Oxford
Road, Manchester M15 6ER
Fax: +44(0)161 275 7471, or email: Frances.Pritchard@manchester.ac.uk

**ALONG THE NORTHERN MESOPOTAMIAN
FRONTIER: THE UPPER TIGRIS REGION
AND ITS SURROUNDING REGIONS DURING
THE EARLY BRONZE AGE (3100-2000 BCE),
ROUNDTABLE, XX EAA, ISTANBUL, 10-14
SEPTEMBER, 2014**

Organizers: Tuba Okse (Kocaeli University) and Nicola Laneri (Catania University)

For northern Mesopotamia, the third millennium BCE represents a period of great transformation characterized by phenomena of increasing social complexity. In particular, archaeologists have encountered a transformation of settlement patterns in this region, with the presence of small-to-medium sized centers during the first half of the millennium and an increasing presence of urban environments during its second half. In particular, it is during the Akkadian period that the whole northern frontier is characterized by a process of territorial conquests enacted by the Akkadian kings, as is demonstrated by the presence of archaeological correlates linked to such imperial endeavors found scattered in the region. Within this landscape, the relationship between Mesopotamia proper (i.e., northern Syria and Iraq) and its northern frontier (i.e., southeast Turkey) has never been thoroughly investigated.

Thus, this round-table aims at investigating the relationships between the different groups inhabiting the northern Mesopotamian frontier with a particular focus on confronting the data emerging from the recent excavations enacted along the upper Tigris regions with the Mesopotamian chronological framework recently established by the ARCANE work group.

If you are interested in participating, please submit an abstract using the following link:
https://www.eaa2014istanbul.org/submission_form

The round-table is under the general theme: T06 Retrieving and Interpreting the Archaeological Record

Deadline for submitting an abstract: January 27th 2014

For further information you can contact the organizers:

Tuba Okse: tubaokse@yahoo.com

Nicola Laneri: nicolalaneri@hotmail.com

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –
JOB VACANCIES/FELLOWSHIPS

SCHOLARSHIPS FOR THE ADVANCED
MASTERS IN STRUCTURAL ANALYSIS OF
MONUMENTS AND HISTORICAL
CONSTRUCTIONS

Dear Colleague,

Please find below information about the Advanced Master Course in Structural Analysis of Existing Buildings, Monuments and Historical Constructions.

I kindly invite you to disseminate this information to anybody who could be interested in applying.

SCHOLARSHIPS FOR THE ADVANCED MASTERS IN STRUCTURAL ANALYSIS OF MONUMENTS AND HISTORICAL CONSTRUCTIONS

Applications for the **Advanced Masters in Structural Analysis of Monuments and Historical Constructions**, approved and financially sponsored by the European Commission within the framework of the Erasmus Mundus Programme, are opened up to January 20, 2014.

This Master Course is organized by a Consortium of leading European Universities/Research Institutions in the field, composed by **University of Minho** (coordinating institution, Portugal), the **Technical University of Catalonia** (Spain), the **Czech Technical University in Prague** (Czech Republic), the **University of Padua** (Italy) and the **Institute of Theoretical and Applied Mechanics of the Czech Academy of Sciences** (Czech Republic). The course combines the most recent advances in research and development with practical applications.

A significant number of **scholarships**, ranging from 4000 to 24000 Euro, are available to students of any nationality.

The Consortium is also available to provide **Erasmus Mundus International Fellowships to outstanding non-European scholars** for teaching and research activities for a period of up to three months.

The SAHC leaflet can be downloaded at www.msc-sahc.org/upload/docs/Leaflet_low.pdf

Please find full details on the MSc programme, as well as electronic application procedure, on the website www.msc-sahc.org

Yours sincerely,

Paulo B. Lourenco
Course Coordinator
Editor of the International Journal of Architectural Heritage: Conservation, Analysis, and
Restoration



PHD POSITIONS IN THE HUMANITIES, **NETHERLANDS ORGANISATION OF** **SCIENTIFIC RESEARCH**

Job description

The Netherlands Organisation for Scientific Research offers 15 positions to MA graduates in different disciplines within the Humanities, including Archaeology. Candidates are expected to complete a PhD thesis within a four-year period. Candidates and their proposals will be judged on:

- overall performance and final grades received so far (for their Bachelor and Master)
- prizes and distinctions
- individual research qualities of the candidate
- international experience
- research and field work experience
- originality of the research proposal
- awareness of theoretical issues
- quality of the proposed methodology incl. sources
- access to archaeological material to be studied (if relevant)
- prospects of completion within 4 years.

Qualifications

- MA degree in Archaeology, or a related discipline (final grade: *Very Good*)
- strong motivation to complete a PhD thesis in four years
- proven affinity with chosen subject
- proven research abilities
- fluency in written and spoken English (TOEFL 620, IELTS 7,5, Cambridge Advanced CAE)

Conditions of employment

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

Application procedure

Please note: it is not possible to apply to these positions directly, as proposals will first have to be selected by the different Research Institutes and Faculties.

Candidates are urged to approach Prof. S. Voutsaki, Professor of Greek Archaeology (s.voutsaki@rug.nl) and submit a research proposal (max. 1500 words) by 20 January 2014.

Preference will be given to topics related to the Aegean Bronze Age, the Greek mainland, mortuary studies and the study of ritual, the archaeology of houses and households, the history of Greek prehistoric archaeology, or the role of archaeology in contemporary society. However, other topics will be considered as well.

Starting date of the PhD project: 1 September 2014.

Information

For more information please contact Prof. S. Voutsaki, s.voutsaki@rug.nl (Please note: she will be away from e-mail between 20 December 2013 and 6 January 2014).

POSTDOCS: IN DATA CURATION AT UCLA

The Council on Library and Information Resources (CLIR) is accepting applications for a two-year Postdoctoral Fellowship in UCLA's Collections, Research and Instructional Services Department of the Charles E. Young Research Library.

The fellow will be based in the Research Library's Research Commons and will be engaged in developing a long-range plan for supporting digital research projects that draw upon resources and expertise of the library's Digital Library Program, the Center for Primary Research and Training (Special Collections) and UCLA's Center for Digital Humanities.

Aspects of the fellowship include work with CDH and Digital Library staff to inventory existing UCLA time-map applications (e.g. AEGARON, UCLA Encyclopedia of Egyptology, Cuneiform Digital Library, and Hypercities) for common and unique components, developing mock-ups or prototypes of functionalities.

Applicants must have received a Ph.D. after January 1, 2009, but before beginning the fellowship in July 2014 and be legally permitted to work in the United States Canada between 2014 and 2016. For position description and application instructions:

<http://www.clir.org/fellowships/postdoc/applicants/UCLA2014>

Alice Anderson Bishop
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INTERNET SITES

PROJECT: HACKSILBER PROJECT - LEAD ISOTOPE AND OTHER ANALYSES OF METAL OBJECTS FROM THE NEAR EAST AND MEDITERRANEAN (1500 - 500 BCE)

Introduction

The Hacksilber Project documents metals in Mediterranean and Near Eastern contexts dating between 1500 and 500 BCE, using lead isotope and other analyses to address long-standing questions of trade, connectivity, ideology and economy.

The Project's flagship archaeometallurgical study centers on the Cisjordan Corpus of Iron Age hacksilber hoards, and its identity as the only coherent body of silver artifacts in the Mediterranean and Near East recognized for its capacity to shed light, within a sequential, chronological framework, on the question of whether the Phoenicians had been engaged in long-distance silver-trade prior to their colonization of the western Mediterranean. The Cisjordan Corpus was identified in 2003 in the *Oxford Journal of Archaeology* (22.1 67-107), and now comprises 36 silver hoards that span the entire Levantine Iron Age from c. 1200 to 586 BCE. The hoards have been recovered from 14 sites between Akko and Arad in today's Israel and Palestinian territories, and the Corpus remains the largest identified concentration of pre-coinage silver hoards in the ancient Near East.

In a recent article in the *Journal of Internet Archaeology*, the Phoenician inscription on the Nora Stone has been combined with metallic evidence from the Cisjordan Corpus and other ancient documentary sources to indicate that the lost region of Tarshish, which the biblical tradition remembers as a supplier of silver to King Solomon, was a large island in the western Mediterranean Sea - the island of Sardinia.

NORA STONE: C. 9TH CENTURY PHOENICIAN INSCRIPTION [LINK]

Lead isotope analyses of the silver objects in the hoards determine the extent to which the ratios of hacksilber artifacts are consistent with ore-bodies in the western and eastern Mediterranean. These data provide a basis for investigating a diachronic increase in the incorporation of silver or lead from places like Spain, Sardinia and the Aegean into the networks that reached the Levant. Related research identifies silver, gold, copper, bronze and lead in other sealed contexts from the same period, particularly graves and hoards, to define comparative data-sets. These comparanda are integrated with the data from the Cisjordan Corpus to reconstruct diachronic, contextual and regional variations in metallic preferences that reflect shifting patterns of circulation, connectivity and, sometimes, ideology.

Related Publications

Thompson, Christine M. 2011 'Silver in the age of iron: an overview', in C. Giardino (ed)

Archeometallurgia: dalla conoscenza alla fruizione. Atti del convegno Cavallino, Lecce, 22-25/05/2006 Bari: Edipuglia. 121-32.

[WorldCat]

Thompson, Christine M. 2009 'Three Twentieth Dynasty silver hoards from the Egyptian garrison', in N. Panitz-Cohen and A. Mazar (eds) Excavations at Tel Beth-Shean 1989-1996. III, The 13th - 11th century BCE strata in areas N and S Jerusalem: Israel Exploration Society. 597-607.

[WorldCat]

Thompson, Christine M. 2003 Sealed Silver in Iron Age Cisjordan and the 'Invention' of Coinage. Oxford Journal of Archaeology 22(1):67-107.

[DOI] [Issue]

Balmuth, M.S. (ed) 2001 Hacksilber to Coinage: New Insights Into the Monetary History of the Near East and Greece. Numismatic Studies no. 24, New York: American Numismatic Society.

[WorldCat]

Balmuth, M.S. and Thompson, C.M. 2000 'Hacksilber: recent approaches to the study of hoards of uncoined silver', in B. Klengel and B. Weisser (eds) Acts of the XIIth International Numismatic Congress, 9–13th September, Berlin, 1997 = XII. Internationaler Numismatischer Kongress, Akten Berlin. 159-69.

[WorldCat]

Suggested Citation for this Project Overview:

Christine Thompson. "Hacksilber Project: (Overview)" (Released 2012-09-19). Christine Thompson (Ed.) Open Context.

Please visit the site: <http://opencontext.org/projects/CF179695-1E6A-440F-1DDB-4FEA7B02A5B5>

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

TOWARDS AN ABSOLUTE CHRONOLOGY FOR THE AEGEAN IRON AGE: NEW RADIOCARBON DATES FROM LEFKANDI, KALAPODI AND CORINTH, PLOS ONE DECEMBER 2013, VOLUME 8, ISSUE 12, E83117

Michael B. Toffolo, Alexander Fantalkin, Irene S. Lemos, Rainer C. S. Felsch, Wolf-Dietrich Niemeier, Guy D. R. Sanders, Israel Finkelstein, Elisabetta Boaretto

Abstract

The relative chronology of the Aegean Iron Age is robust. It is based on minute stylistic changes in the Submycenaean, Protogeometric and Geometric styles and their sub-phases. Yet, the absolute chronology of the time-span between the final stages of Late Helladic IIIc in the late second millennium BCE and the archaic colonization of Italy and Sicily toward the end of the 8th century BCE lacks archaeological contexts that can be directly related to events carrying absolute dates mentioned in Egyptian/Near Eastern historical sources, or to well-dated Egyptian/Near Eastern rulers. The small number of radiocarbon dates available for this time span is not sufficient to establish an absolute chronological sequence. Here we present a new set of short-lived radiocarbon dates from the sites of Lefkandi, Kalapodi and Corinth in Greece. We focus on the crucial transition from the Submycenaean to the Protogeometric periods. This transition is placed in the late 11th century BCE according to the Conventional Aegean Chronology and in the late 12th century BCE according to the High Aegean Chronology. Our results place it in the second half of the 11th century BCE.

Go there for link to download:

**<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0083117>
is posted this article.**

**ROUTES MARITIMES ET SYSTEMES
D’ECHANGES INTERNATIONAUX AU
BRONZE RECENT EN MEDITERRANEE
ORIENTALE, CAROLINE SAUVAGE**

Travaux de la Maison de l’Orient et de la Méditerranée, 61. Lyon: Maison de l’Orient et de la Méditerranée – Jean Pouilloux, 2012. Pp. 374. ISBN 9782356680280. €44.00.

Reviewed by Jason W. Earle, The Institute for Aegean Prehistory (jearle@instap.org)

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International exchanges, and the maritime routes that facilitated them, have received much attention from scholars of the Late Bronze Age eastern Mediterranean in recent decades. Caroline Sauvage makes a unique contribution to this scholarship with this book, which is based on her 2006 dissertation. Sauvage’s aim, as stated in the Introduction (p. 19), is to survey and synthesize evidence from various disciplines (archaeology, Egyptian and Akkadian epigraphy, geography, ship construction, maritime law, economics, etc.). This nuanced presentation is intended to counterbalance prevailing mono-disciplinary views, not to offer a definitive explanation of the mechanisms that moved materials and objects around the eastern Mediterranean. Sauvage limits her discussion chronologically to the Egyptian 18th and 19th Dynasties (defined in absolute dates as the mid-16th to mid-12th century BC) and geographically to the Aegean, Anatolia, Cyprus, the Levant and Egypt (p. 20). An overview of the evidence (coastal archaeological sites, shipwrecks, ancient texts and illustrations, geography, winds and currents) in the Introduction makes clear the questions to be addressed, as well as the potential rewards and limitations of this study (pp. 21–22).

The book is divided into three parts: Part 1 discusses ‘Geographies and Materials’, Part 2 covers ‘Economies and International Relations’ (i.e., the social aspects of commercial activities), and Part 3 deals with ‘Ships and Routes’. Each part is composed of two chapters, and each chapter contains numerous sections. Although well organized and logically presented, the sheer number of subdivisions within each chapter at times makes the text difficult to follow. That said, a ‘Conclusions’ section at the end of each chapter helpfully recapitulates the main points.

Chapter 1 begins with a geographic survey of the regions under scrutiny, proceeding clockwise around the eastern Mediterranean (starting in Anatolia and ending on Crete). For each region, Sauvage describes the nature of the shoreline and expounds on a selection of coastal sites. Unfortunately, it is unclear why certain sites were chosen over others (despite a list of criteria on p. 27), and the selectiveness results in a distorted picture of settlement patterns and regional site hierarchies. Moreover, there is little consistency to the order and type of information presented for each site. The final section of the chapter surveys the different types of natural harbors and manmade facilities attested. A short section on the use of topographical markers in navigation seems out of place in this chapter and might have been better placed in Chapter 6.

Chapter 2 examines the various materials and products exchanged, their sources, and, to a limited extent, their distributions in the archaeological record. An extensive review of the materials exchanged (as known from shipwrecks, texts and terrestrial archaeology) follows, and is organized by type: manufactured objects and tribute gifts, animals and animal materials, minerals, metals, vegetable materials, woods, and ships and ship parts. Sauvage divides these goods and materials into two principal categories: luxury products and consumer products. The former consists of objects mentioned in the texts as tribute gifts, exchanges between royal courts, and materials of value or prestige (sometimes transported in ceramics). The latter are utilitarian objects, such as ceramic tablewares, which are not mentioned in the texts but are frequently found in excavations.

Sauvage suggests that objects of these two categories may have traveled in separate maritime trade circuits, but does not investigate further how the trade in consumer products operated. Readers hoping to find an extensive discussion of the ceramics trade will be disappointed.

Chapter 3 presents the textual and archaeological evidence for long-distance transactions. Sauvage (following Heltzer and Janssen) appraises the cargoes of the known Late Bronze Age shipwrecks using commodity values recorded in Ugaritic, Egyptian and Hittite texts. The question of whether long-distance transactions were royal or private initiatives is then addressed, with Sauvage concluding that “vessels were royal properties and their maintenance depended on the governing power” (p. 156), and that there is no evidence for international merchants operating completely independent of the governing power (p. 161). The possibility that the textual evidence presents a biased (royal) picture of trade activities, while acknowledged by Sauvage, should temper her conclusions more strongly than is the case.

Chapter 4 addresses evidence for the protection and regulation of long-distance maritime voyages and trade: treaties, laws, commercial firms, loans, insurance, arrival protocols and import taxes. Sauvage’s consideration of relations between polities is commendable, as is her discussion of the prevailing economic systems in these regions. The final two sections of this chapter address the use of economic models in interpreting the archaeological and textual evidence. The existence of market economies (in Polanyian terms) is denied, although market elements may account for facts difficult to explain from a purely social perspective, such as the organization of Ugaritic merchants into firms (p. 205). Next, various models of prehistoric exchange are summarized, but preferential treatment is given to those of Polanyi and Renfrew. Only passing attention is paid to the concepts of core–periphery interactions and gateway communities. Sauvage balks at exploring these models’ applicability to maritime trade in the Late Bronze Age eastern Mediterranean, conceding that different models may operate simultaneously within a society, that it is difficult to distinguish between various models on the basis of the archaeological evidence, and that there are other ways for acquiring goods and materials besides commerce (e.g., pillaging, piracy).

Chapter 5 focuses on the evidence for ship construction and documents the existence of various ship types. Sauvage argues that Late Bronze Age ships were the result of a long period of assimilation and combination of diverse technologies, and suggests that the geographic names of ships (e.g., ‘ships of Byblos’) recorded in texts may reflect the technological origins of certain vessel types rather than their home port. To judge by the large numbers of ships mentioned in texts, Sauvage posits that there must have been

intense exchanges between regions (p. 259)—an implicit argument against the (unacknowledged) minimalist perspective of Bronze Age trade.¹

Chapter 6 assesses probable sea routes within the eastern Mediterranean in the light of the textual/archaeological evidence and geographic/climatological factors. The notion of seasonal navigation, briefly addressed earlier in relation to treaties forbidding the overwintering of foreign merchants (p. 168), is cogently explained by changes in the direction and intensity of prevailing winds. A review of natural hazards posed by coastal navigation is complemented by a discussion of offshore navigation skills and techniques. By demonstrating that skilled sailors could establish their approximate position on the open sea, Sauvage makes a compelling case for such voyages and counters a prevalent view that sailors tended to hug the coasts of the eastern Mediterranean.

While this is a strong book, a few flaws must be noted. First, the picture painted by Sauvage is somewhat static due to a tendency to collapse evidence from different times (as in her discussion of the Aegean olive oil trade on p. 129). Consequently, there is little consideration of diachronic developments in maritime commerce vis-à-vis cultural, political and economic changes.² Moreover, the questions of why and how this complex web of long-distance maritime exchanges emerged in the first place are left unasked. Another shortcoming is the absence of a focused discussion of non-palatial trade, i.e., of intra-regional cabotage. While Sauvage acknowledges the probable existence of ‘independent’ merchants acting locally (p. 274), she does not develop any models.³ The transport and use of sub-elite goods like Mycenaean pottery, which has been found in considerable quantities in Cyprus, the Levant and Egypt, are largely unconsidered despite many publications on the subject.⁴

More generally, a chronological chart is absent, and the maps do not include many of the sites mentioned in the text. Illustrations of the places and objects discussed are uneven; for instance, the Levantine sites surveyed in Chapter 1 are accompanied by many figures whereas three of the four Aegean sites presented have none at all. These deficiencies are regrettable since few readers will be conversant with the entire range of materials covered.

All in all, Sauvage provides an admirable overview of the multifarious factors that conditioned long-distance maritime commerce in the Late Bronze Age eastern Mediterranean. Scholars of this area and period will welcome Sauvage’s book for its nuanced synthesis of international exchanges from a variety of viewpoints.

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1. E.g., A.M. Snodgrass, “Bronze Age Exchange: A Minimalist Position,” in N.H. Gale (ed.), *Bronze Age Trade in the Mediterranean. Papers Presented at the Conference Held at Rewley House, Oxford, in December 1989* (Jonsered: Paul Åströms Förlag, 1991), pp. 15–20; S.W. Manning and L. Hulin, “Maritime Commerce and Geographies of Mobility in the Late Bronze Age of the Eastern Mediterranean: Problematizations,” in E. Blake and A.B. Knapp (eds.), *The Archaeology of Mediterranean Prehistory* (Oxford: Blackwell Publishing, 2005), pp. 270–302.
2. Cf. A. Sherratt and S. Sherratt, “From Luxuries to Commodities: The Nature of Mediterranean Bronze Age Trading Systems,” in N.H. Gale (ed.), *Bronze Age Trade in the Mediterranean* (Jonsered: Paul Åströms Förlag, 1991), pp. 351–386; S. Sherratt, “Potemkin Palaces and Route-based Economies,” in S. Voutsaki and J. Killen (eds.), *Economy and Politics in the Mycenaean Palace States: Proceedings of a Conference Held on 1–3 July 1999 in the Faculty of Classics, Cambridge* (Cambridge: Cambridge Philological Society, 2001), pp. 214–254.
3. Information from later periods might prove useful in this regard: cf. P. Horden and N. Purcell, *The Corrupting Sea: A Study of Mediterranean History* (Oxford: Blackwell, 2000).
4. See, e.g., S. Sherratt, “E pur si muove: Pots Markets and Values in the Second Millennium Mediterranean,” in J. P. Crielaard, V. Stissi, and G. J. van Wijngaarden (eds.), *The Complex Past of Pottery: Production, Circulation and Consumption of Mycenaean and Greek Pottery (Sixteenth to Early Fifth Centuries BC). Proceedings of the ARCHON International Conference, Held in Amsterdam, 8–9 November 1996* (Amsterdam: J. C. Gieben, 1999), pp. 163–211; G.J. van Wijngaarden, *Use and Appreciation of Mycenaean Pottery in the Levant, Cyprus and Italy (1600–1200 BC)* (Amsterdam, Amsterdam University Press, 2002); P.W. Stockhammer, “Conceptualizing Cultural Hybridization in Archaeology,” in P.W. Stockhammer (ed.), *Conceptualizing Cultural Hybridization: A Transdisciplinary Approach* (Berlin: Springer, 2012), pp. 43–58.

Please visit the site: <http://bmcr.brynmawr.edu/2013/2013-12-37.html>

EARLY URBAN IMPACT ON MEDITERRANEAN COASTAL ENVIRONMENTS

David Kaniewski, Elise Van Campo, Christophe Morhange, Joël Guiot, Dov Zviely, Idan Shaked, Thierry Otto & Michal Artzy

Scientific Reports 3, Article number: 3540 doi:10.1038/srep03540 Published 18 December 2013

Abstract

A common belief is that, unlike today, ancient urban areas developed in a sustainable way within the environmental limits of local natural resources and the ecosystem's capacity to respond. This long-held paradigm is based on a weak knowledge of the processes underpinning the emergence of urban life and the rise of an urban-adapted environment in and beyond city boundaries. Here, we report a 6000-year record of environmental changes around the port city of Akko (Acre), Israel, to analyse ecological processes and patterns stemming from the emergence and growth of urban life. We show that early urban development deeply transformed pre-existing ecosystems, swiftly leading to an urban environment already governed by its own ecological rules and this, since the emergence of the cities.

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Please visit the site:

<http://www.nature.com/srep/2013/131218/srep03540/full/srep03540.html> [Go there for full article]

KING SOLOMON'S SILVER? SOUTHERN PHOENICIAN HACKSILBER HOARDS AND THE LOCATION OF TARSHISH

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Summary

Hacksilber from Akko, in the form of 'chocolate-bar' ingots. Objects like these functioned as money and as raw material before coinage.

Evidence from silver hoards found in Phoenicia is linking Tarshish, the legendary source of King Solomon's silver, to ores in the western Mediterranean. Biblical passages sometimes describe this lost land as a supplier of metals (especially silver) to Phoenician sailors who traded in the service of Solomon and Hiram of Tyre in the 10th century BC. Classical authors similarly attribute the mercantile supremacy of the Phoenicians to their command of lucrative supplies of silver in the west, before they colonised the coasts and islands of its metalliferous regions around 800 BC. Conservative rejections of such reports have correctly emphasised a lack of evidence from silver. Lead isotope analyses of silver hoards found in Phoenicia now provide the initial evidence for pre-colonial silver-trade with the west; ore-provenance data correlate with the ancient documents that indicate both Sardinia and Spain as suppliers, and Sardinia as the island of Tarshish.

Please visit the site: http://intarch.ac.uk/journal/issue35/thompson_index.html [Go there for subscription to download the article] [Notice of this article at: <http://www.biblicalarchaeology.org/daily/archaeology-today/biblical-archaeology-topics/tarshish-hacksilber-hoards-pinpoint-solomons-silver-source/>]

EΙΔΗΣΕΙΣ - NEWS RELEASE

ANCIENT ROMAN METAL USED FOR PHYSICS EXPERIMENTS IGNITES SCIENCE FEUD, BY CLARA MOSKOWITZ

Physicists prefer Roman-era lead ingots to recently mined metal for shielding particle experiments, but archaeologists want them preserved

Archaeologists and physicists are at loggerheads over ancient Roman lead—a substance highly prized by both camps for sharply diverging reasons. Very old lead is pure, dense and much less radioactive than the newly mined metal, so it is ideal for shielding sensitive experiments that hunt for dark matter and other rare particles. But it is also has historical significance, and many archaeologists object to melting down 2,000-year-old Roman ingots that are powerful windows on ancient history.

"Are these experiments important enough to destroy parts of our past, to discover something about our future?" says Elena Perez-Alvaro, an archaeology graduate student at the University of Birmingham in England, who wrote a paper on the dilemmas involved in Rosetta (pdf), an archeological journal published by the University of Birmingham. Some physicists argue that getting hold of the metal is worth fighting for. "These experiments can reveal some of the most fundamental properties of the universe, and answer questions such as what are we and where we come from," says physicist M. Fernando Gonzalez-Zalba of the University of Cambridge, who collaborated with Perez-Alvaro's investigation. "I think it's worth it."

Ancient Roman lead has been used in the Cryogenic Dark Matter Search (CDMS), an experiment in Minnesota that aims to detect the particles that make up the invisible dark matter thought to contribute much of the universe's mass. The same metal has also been used in the CUORE (Cryogenic Underground Observatory for Rare Events) project in Italy, which will soon begin searching for a theorized particle decay process called neutrinoless double beta decay, which, if found, could explain why matter dominates antimatter in the universe. These experiments and others require extreme shielding to block out any extraneous particles that might be mistaken for the rare signals they hunt.

The lead in question once went into the making of coins, pipes, construction materials and weapons in the ancient Roman civilization. It is most commonly found now at shipwreck sites, where private companies harvest it and melt down the Roman ingots into standard bricks before passing them on to customers—many of whom are physicists. "None of us take it casually—you don't want historical artifacts to be destroyed unnecessarily," says physicist Blas Cabrera of Stanford University, who leads the CDMS project. Nevertheless, ancient lead is the best material available for shielding dark matter detectors, he says, because it releases so little radiation, or background particles. "The kind of background levels that you're achieving with ancient lead are roughly 1,000 times below that of commercially available lead."

All lead mined on Earth naturally contains some amount of the radioactive element uranium 235, which decays, over time, into another radioactive element, a version of lead called lead 210. When lead ore is first processed, it is purified and most of the uranium is removed. Whatever lead 210 is already present begins to break down, with half of it decaying on average every 22 years. In Roman lead almost all of the lead 210 has already decayed, whereas in lead mined today, it is just beginning to decay. (Of course, many lead 210 atoms have already decayed in this ore, too, but the supply is constantly replenished by uranium in unprocessed lead). "The longer since it was originally processed, the lower its intrinsic radioactivity," Gonzalez-Zalba says.

The Romans were not the first lead brick makers—the ancient Greeks were also manufacturing the building material about 200 years earlier. Whereas this lead probably also finds its way into some physics experiments, it is scarcer. And the supply of Roman lead is not exactly plentiful, either. "We may lose all ancient Roman lead—and therefore the information about ancient technology, shipping, trade, etcetera it can offer—if its use for this kind of purpose becomes widespread," says archaeologist John Carman, Perez-Alvaro's advisor at the University of Birmingham. By preserving the ingots, archaeologists hope to learn more about the technology, industry and culture of the Romans. Future technology may be able to pry more secrets out of the artifacts than present studies can do, so leaving the objects undisturbed, preferably at the shipwreck site, is ideal.

The law surrounding this dispute is murky. The 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (pdf) prohibits commercial exploitation of historical shipwreck artifacts. Whether that applies to physics experiments is unclear. "Because the final use of the lead is for knowledge, not actually for the marketplace, this lies somewhere in between," Gonzalez-Zalba says. "This is where the regulation is not 100 percent clear about it." Both archaeologists and physicists say better guidelines are necessary. "We need the sort of deep analysis of the issues involved that Elena is undertaking, followed by a serious debate involving all interested parties, including international bodies such as UNESCO, to construct a set of clear guidelines that will hopefully protect the interests of the scientific community, including that of archaeology," Carman says.

Ultimately, all parties seek a compromise that will preserve history yet enable cutting-edge physics. After all, the Romans were famous innovators, and would probably smile to know how their lost ingots were being used today.

Please visit the site: <http://www.scientificamerican.com/article.cfm?id=ancient-roman-lead-physics-archaeology-controversy>

NEANDERTHALS AND THE DEAD, BY JOHN NOBLE WILFORD

Early in the 20th century, two brothers discovered a nearly complete Neanderthal skeleton in a pit inside a cave at La Chapelle-aux-Saints, in southwestern France. The discovery raised the possibility that these evolutionary relatives of ours intentionally buried their dead — at least 50,000 years ago, before the arrival of anatomically modern humans in Europe.

These and at least 40 subsequent discoveries, a few as far from Europe as Israel and Iraq, appeared to suggest that Neanderthals, long thought of as brutish cave dwellers, actually had complex funeral practices. Yet a significant number of researchers have since objected that the burials were misinterpreted, and might not represent any advance in cognitive and symbolic behavior.

Now an international team of scientists is reporting that a 13-year re-examination of the burials at La Chapelle-aux-Saints supports the earlier claims that the burials were intentional.

The researchers — archaeologists, geologists and paleoanthropologists — not only studied the skeleton from the original excavations, but found more Neanderthal remains, from two children and an adult. They also studied the bones of other animals in the cave, mainly bison and reindeer, and the geology of the burial pits.

The findings, in this week's issue of Proceedings of the National Academy of Sciences, "buttress claims for complex symbolic behavior among Western European Neanderthals," the scientists reported.

William Rendu, the paper's lead author and a researcher at the Center for International Research in the Humanities and Social Sciences in New York, said in an interview that the geology of the burial pits "cannot be explained by natural events" and that "there is no sign of weathering and scavenging by animals," which means the bodies were covered soon after death.

"While we cannot know if this practice was part of a ritual or merely pragmatic," Dr. Rendu said in a statement issued by New York University, "the discovery reduces the behavioral distance between them and us."

The research center is a collaboration between N.Y.U. and the National Center for Scientific Research in France. Much of the fieldwork involved researchers from the University of Bordeaux and Archéosphère, a private research firm in France.

In light of these findings and other recent studies, Dr. Rendu's team concluded in the journal, "It now appears that a general reassessment" of these early burial practices "needs to be undertaken with the aim of furnishing new scientific arguments and evidence relevant to the ongoing debate surrounding Neanderthal symbolic behavior."

Eric Trinkaus of Washington University in St. Louis, a paleoanthropologist and expert on the Neanderthals who edited the journal paper, said in an interview that the new evidence of intentional burials was “very substantial and solid.” He said he had visited the cave last year and “gone over all the pros and cons with the team leaders.”

Asked if the evidence would quiet the skeptics of Neanderthal burial practices, Dr. Trinkaus replied: “I certainly hope it does. Indeed, they buried their dead.”

Please visit the site: <http://www.nytimes.com/2013/12/17/science/neanderthals-and-the-dead.html>

WAS NOAH'S ARK ROUND? **BY SUZANNAH HILLS**

Scholar says 3,700-year-old clay tablet reveals boat was a coracle made out of reeds and bitumen

Dr Irving Finkel has translated cuneiform text on an 3,700-old clay tablet. The ancient script details the Mesopotamian story of Noah's Ark. The text also contains instructions on how to build an ark to escape a flood. But it describes the craft as being a round 220-ft diameter coracle. The design is very different to the popular imagining of a traditional ship.

Noah's Ark is often depicted as a pointy-prowed traditional ship.

But new research suggests it was very different from popular imagining, and was actually a circular craft made out of reeds.

Dr Irving Finkel reveals his ground-breaking discovery into the ancient myth in his new book called *In The Ark Before Noah: Decoding The Story Of The Flood*.

As an expert in deciphering cuneiform script, Dr Finkel managed to piece together information on the ark from a 3,700-year-old clay tablet.

New revelation: According to an ancient Babylonian tablet, Noah's Ark was a 220-ft wide coracle - the equivalent of six London buses - with walls 20-ft high.

His translation of the ancient text throws light on the Mesopotamian story, which became the account in Genesis in the Old Testament, of Noah and the ark that saved his menagerie from the flood waters which drowned every other living thing on earth.

The text describes god speaking to Atram-Hasis, a Sumerian king who is the Noah figure in earlier versions of the ark story.

He says: 'Wall, wall! Reed wall, reed wall! Atram-Hasis, pay heed to my advice, that you may live forever! Destroy your house, build a boat; despise possessions. And save life! Draw out the boat that you will built with a circular design; Let its length and breadth be the same.'

Dr Irving Finkel, Assistant Keeper of the Department of the Middle East at the British Museum, translated the cuneiform script on the tablet.

The ancient Babylonian text describes the ark as a round 220-ft diameter coracle with walls 20-ft high.

According to the tablet, the ark had two levels and a roof on the top. The craft was divided into sections to divide the various animals into their own sections.

The 60 lines of text, which Dr Finkel describes as a 'detailed construction manual for building an ark', claims the craft was built using ropes and reeds before being smeared with bitumen to make it waterproof.

There are dozens of ancient tablets that have been found which describe the flood story but Finkel, Assistant Keeper of Ancient Mesopotamian script, languages and cultures Department at the British Museum, says this one is the first to describe the vessel's shape.

'In all the images ever made people assumed the ark was, in effect, an ocean-going boat, with a pointed stem and stern for riding the waves – so that is how they portrayed it,' said Finkel.

'But the ark didn't have to go anywhere, it just had to float, and the instructions are for a type of craft which they knew very well. It's still sometimes used in Iran and Iraq today, a type of round coracle which they would have known exactly how to use to transport animals across a river or floods.'

Channel 4 is now planning a documentary based on the reconstruction of the ark following the guidelines on the tablet which dates from about 1850 BC.

The artefact was discovered in the Middle East by Leonard Simmons, who indulged his passion for history while serving in the RAF from 1945 to 1948. The relic was passed to his son Douglas, who took it to Dr Finkel to translate.

Please visit the site: <http://www.dailymail.co.uk/news/article-2524056/Noahs-Ark-coracle-reeds-bitumen-reveals-Babylonian-text.html>

TWO PTOLEMAIC TOMBS WAS UNCOVERED TODAY IN THE ROMAN NECROPOLIS AT EAST IN THE CANAL CITY OF ISMAILIYA, BY NEVINE EL-AREF

At the Roman necropolis in Al-Qantara East the Egyptian mission of the Ministry of State of Antiquities (MSA) uncovered two Ptolemaic tombs that can be dated to the first century AD.

MSA Minister Mohamed Ibrahim told Ahram Online that the first tomb belongs to a priest called Mina from a Roman area named Sila.

The tomb is 6.5 meters high and 2.5 meters long. It is built of mud brick and has a vaulted ceiling and a burial shaft. One of the tomb's walls is decorated with coloured paintings depicting Mina in front of the goddess Isis.

The second tomb, according to Ibrahim, is built of limestone but still not yet identified. It contains a collection of Ptolemaic clay pots and pans.

Mohamed Abdel Maqsood, head of the Ancient Egyptian Section in the MSA, said that the necropolis was subjected to illegal excavation, but the Ismailiya police caught the culprits.

He also added that the illegal excavation forced the ministry to immediately begin its own excavation there.

Al-Qantara East has a rich history, dating back to the pharaonic era. Ahmose I, a pharaoh who founded the 18th century, waged many important wars in the area, most notably against the Hyksos, Seti, and Ramses II.

In modern times, it was the site of numerous World War I battles between the Allies and Turkish forces, as well as the main base of the Australian Light Horse operations in Sinai from 1916 until 1920.

It was also the site of a massive warehouse and hospital centre, which were used again in World War II.

Please visit the site:

<http://english.ahram.org.eg/NewsContent/9/40/88863/Heritage/Ancient-Egypt/Two-Ptolomaic-tombs-uncovered-in-AlQantara-East.aspx>

NO MORE HEROES? DIGGING DEEPER INTO THE MASADA MYTH 50 YEARS AFTER THE FIRST ARCHAEOLOGICAL DIGS, MYSTERY REMAINS: DID ANY BATTLE HAPPEN THERE AT ALL? BY MOSHE GILAD

Since October 1963, when archaeological excavations were carried out at Herod's ancient mountain fortress at Masada under the direction of Yigael Yadin, the desert site has gripped the world's imagination.

The primary ancient source of information about Masada is Romano-Jewish scholar Flavius Josephus, whose writings most modern researchers view as relatively reliable. Then again, they don't have another, better source.

Masada – some 100 kilometers south of Jerusalem – played a role in the Jewish revolt against the Roman Empire during the period 66 C.E.-73 C.E. The Roman army crushed the rebellion and Masada appears to have been the scene of the final tragic chapter of the story.

According to Josephus, 967 people who fled the Romans to Masada committed suicide, choosing to die rather than be taken captive.

There are differences of opinion, however, about exactly what happened on the site overlooking the Dead Sea, and the controversy about what took place some 2,000 years ago still prompts heated debate among academics. Participants at a recent conference held in Jerusalem, Ein Gedi and at Masada itself, to mark the 50th anniversary of the excavations, spoke with movingly about their experiences at the time, which however shed little light on persisting mysteries.

Ancient parchment in Hebrew

Malka HersHKovitz, who for two years served as secretary of the Masada archaeological expedition in the 1960s, recounted the moment she first caught sight of a piece of ancient parchment she had found there with Hebrew lettering. It contained the passage from the Book of Ezekiel with the prophet's vision of the revival of dry bones, which has been analogized to the rebirth of the Jewish people in their homeland.

“That was the most moving experience of my life, with the earth coming back to life in front of me,” she recalled.

For his part, Prof. Amnon Ben-Tor, a highly experienced archaeologist, recalled that his most exciting ancient find was the braid and sandals he uncovered in the northern palace at Masada.

The fame of the Masada story had developed well before Yadin's excavations. In 1927, Yitzhak Lamdan published a poem entitled "Masada" that was widely circulated. Passages eventually became part of the school curriculum and were read at ceremonies on Masada itself.

The famous expression "Masada shall not fall again" is taken from Lamdan's poem.

Kibbutz Na'an's Shmaryahu Gutman, considered the father of the legend of Masada, visited the site as far back as 1933, and understood the powerful potential of the site.

Downplaying the role of 'dagger-men'

Sociologist Nachman Ben-Yehuda, who researched what he called "the Masada myth," noted that in the 1940s, when the Jewish community of prestate Israel was living under the threat of a possible invasion by Nazi Germany, the story of Masada had special relevance. "Look at the heroes of Masada," he told his students. "They were like us and were prepared to die for their freedom."

Many members of the country's youth movements have been brought to Masada with the same message, climbing the steep Snake Path from the foot of the mountain to the top of Masada, where they have watched the sun rise over the Dead Sea and been captivated by the magic of the place.

"In my view, Masada is an amazing site," Ben-Yehuda said, "but it's important to understand how the myth about it was created. Masada's greatest advantage over other sites is that it has a good story that's easy to understand. The secret of Masada is an exciting story attached to a successful site."

In his writings, Ben-Yehuda has explained how, in an effort to create the myth, Gutman altered a number of details of the story recounted by Josephus. Gone, for example, was the presence of the Sicarii – a cruel, extremist group of Jewish zealots – along with Josephus' account of a massacre at nearby Ein Gedi. In the 1960s, when Yadin wrote two books about Masada, he chose to refer to the Jews under Roman siege on the mountain as zealots, but did not mention the extremist Sicarii (meaning "dagger men") at all.

"It was functional and very important in the 1940s," Ben-Yehuda explained. "There is no people that does not have myths of heroism, and for many years Masada served as our myth."

The status of the myth changed over the years, and in large part the magic of Masada as a heroic myth was lost. The turning point occurred after the Six-Day War in 1967. The war granted the Israeli public access to sites such as the Western Wall and the rest of the Old City of Jerusalem, as well as sites such as Gamla in the Golan Heights and the Tomb of the Patriarchs in Hebron, which took Masada's place.

Archaeology wars

Archaeological excavations were carried out at Masada long before Yadin's group, but the scope and effort, and particularly the duration of the dig carried out under Yadin's direction, were without precedent. It appeared as if, in the early 1960s, the entire country

had been mobilized in the archaeological undertaking. The dig would scientifically either verify or dispel Josephus' account.

The excavations lasted two digging seasons – from October 1963 to April 1964, and then again from December 1964 to March 1965. Hundreds of people participated, including a large number of volunteers from abroad.

Today, researchers are in agreement that Yadin came to conclusions that reinforced the overall picture portrayed by Josephus. Some experts say the problem with researching the site stems from the fact that Yadin did not approach Josephus' account with a sufficiently critical eye. In a few instances, they say, Yadin even cut corners to get the archaeological finds to fit Josephus' account.

Additional excavations were carried out at Masada in 1989, under the direction of Prof. Ehud Netzer of the Hebrew University, and in 1995-1997 by Netzer, Guy Stiebel and Gideon Foerster. According to Yadin Roman, the editor of Eretz magazine – soon to publish a special issue to mark the 50th anniversary of Yadin's Masada dig – more than 5,000 foreign volunteers worked at the site over the years, in addition to a similar number of Israelis.

There are currently two researchers at the center of the archaeological controversy over Masada – Haim Goldfus and Benny Arubas, who have argued for years that the Masada story has been distorted. Many people, Goldfus maintains, “choose not to look reality in the eye.”

The Masada story as told by Josephus didn't really happen that way, Goldfus insists, claiming that Josephus himself was in Rome when Masada fell.

“In reality, a different [series of] events took place at Masada, and apparently there was no war there at all,” says Goldfus. “There is no evidence at all at the site of blood being spilled in battle. The famous battery [at a site commonly referred to as the Roman ramp] couldn't have fulfilled the role attributed to it in breaking through the wall, because it was too narrow and small and couldn't have been used by the Roman army to position a battering ram. In light of the finds in the area where the [Romans] broke through, we understood that nothing happened there. There are no arrowheads, as one finds at other sites. There is no evidence of fires. The indications are that the battery structure was mostly naturally occurring.

“In addition,” he continues, “there are no mounds from walls that had been destroyed, or other evidence of a battle.”

Goldfus says he has no interest in either dispelling the Masada myth or confirming it. “I am also not claiming that [the Jews at the site] didn't commit suicide. Maybe it did happen. Perhaps the Romans entered the site in a commando raid, but for 50 years they have been portraying a false picture of a heroic battle that didn't take place. In reality, other things happened there, and I don't know what they were.”

‘A national mission’

David Mevorah, a curator at the Israel Museum, thinks the timing of Yadin's excavations at Masada – the most popular tourist attraction in the country for which an admission fee is charged – is the key to understanding the myth. “In the early 1960s, the site provided a major national story, and Yadin knew how to harness the national aspect for his needs. There is no other site at which so much has been invested, with the assistance of the army and government. Yadin, a former [Israel Defense Forces] chief of staff, turned Masada into a national mission, and into a lot more than another archaeological research project,” says Mevorah.

Yadin's greatest success, adds Mevorah, lies in the fact that, coming after Gutman – and with Gutman's help – he knew how to make the site connect emotionally. “People come because of that. Of course, there are also patriotic, national and machoistic elements,” says Mevorah.

“Following all of this, major investments were made in infrastructure, site development, construction of a cable car, a guesthouse and a museum.”

Like many others, Mevorah gives credit in managing the site to Eitan Campbell of the Israel Nature and Parks Authority, who has run Masada National Park for a dozen years. Campbell acknowledges that previously it was hard for him not to get upset over the claims of those who would undermine the classic Masada narrative, people whom he viewed as heartless provocateurs.

Now though, he says, it's different. “I've understood that controversy is good for the site. It keeps us on our toes, inquisitive and up-to-date.”

Development of the site is the thing closest to Campbell's heart. And when it comes to this, too, he is well aware that the issue has sparked controversy and differences of opinion. “There are a large number of visitors here, and we have to provide them with basic facilities. We came in for major criticism when a McDonald's branch was opened here, but it's important to make clear that we are absolutely not Disneyland.”

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Modern-day Masada. Archaeologists are split on whether it's a tall tale or the stuff of legends.

Photo by Moshe Gilad

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Yigael Yadin, left, with a group of British donors at the excavation site in 1963.

Photo by Adi Hirshbein / Bitmuna Collection

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Masada.

Moshe Gilad

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Masada.

Moshe Gilad

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Modern-day Masada.

Moshe Gilad

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Masada, the northern palace.

Moshe Gilad

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Masada.

Moshe Gilad

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Masada.

Moshe Gilad

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Masada, the northern palace.

Moshe Gilad

[Additional pictures and captions (translated) from the Hebrew article.]

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Yigael Yadin (at left) at the site of the excavations, 1963 Photo by Adi Hirshbein / OS

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Photo: Moshe Gilad

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also at <http://www.haaretz.com/archaeology/.premium-1.559185>**

VIRTUAL ARCHAEOLOGIST AT IU TURNS CLOCK BACK MILLENNIA TO UNCOVER SECRETS OF ANCIENT ROME, NASA DATA, SIMULATIONS USED TO CONNECT EGYPTIAN OBELISK, AUGUSTUS' 'ALTAR OF PEACE'

An Indiana University archaeo-informaticist has used virtual simulations to flip the calendar back thousands of years and show for the first time the historical significance of the unique alignment of the sun with two monuments tied to the founder of the Roman Empire.

For nearly a half-century, scholars had associated the relationship between the Ara Pacis, the “Altar of Peace” dedicated in 9 BC to then-emperor Augustus, and the Obelisk of Montecitorio -- a 71-foot-high granite obelisk Augustus brought to Rome from Egypt -- with Augustus’ Sept. 23 birthday.

Prevailing research had found that on this day, the shadow of the obelisk -- serving as the pointer, or gnomon, of a giant sundial on the plaza floor -- would point toward the middle of the Ara Pacis, which the Roman Senate had commissioned to recognize the peace brought to the Roman Empire through Augustus' military victories.

Over his nearly 40 years of teaching Roman topography classes, IU Bloomington School of Informatics and Computing professor Bernie Frischer had always informed students of that prevailing theory, but today in an announcement made at the Vatican’s Pontifical Archaeological Academy in Rome, Frischer provided another explanation for the original placement of the two landmarks that were both parallel and adjacent to what was at the time the major road, the Via Flaminia, leading from Rome over the Apennine Mountains to the coast of the Adriatic Sea.

“What's important is not the shadow of the obelisk, but the sun's disk seen over the center of the top of the obelisk from a position on the Via Flaminia in front of the Ara Pacis,” Frischer said. New computer simulations now show that German scholar Edmund Buchner's longstanding theory that the shadow of the obelisk hit the center of the facade of the Ara Pacis was wrong.

GPS coordinates, known dimensions and additional bibliographical sources were also used to create the 3-D models of the Ara Pacis, the meridian and the obelisk, all of which would have been located at the 490-acre site then known as the Campus Martius. Frischer said his Rome-based research assistant Ismini Miliaris conducted critical research on the meridian line location, and independent scholar and professional meridian designer and engineer Paolo Albèri Auber conducted the refined work on the obelisk’s original size.

Using NASA's Horizons System, which gives the position of objects in the solar system in the sky at any time in history as seen from any spot on earth, along with surveys of the location of the sundial's original meridian line, and the height of the obelisk in exacting detail, Frischer and a team that included John Fillwalk, director of the Institute for Digital Intermedia Arts at Ball State University, determined the sun's placement at the top of the obelisk occurred on Oct. 9.

“Inscriptions on the obelisk show that Augustus explicitly dedicated the obelisk to his favorite deity, Apollo, the Sun god,” Frischer said. “And the most lavish new temple Augustus built, the Temple of Palatine Apollo, was dedicated to his patron god and built right next to Augustus' own home.

“So the new date of the alignment, Oct. 9, is actually what we know to be the annual birthday festival of the Temple of Palatine Apollo,” he said. “No other date on the Roman religious calendar would have been as appropriate as this.”

While Fillwalk and the IDIA Lab at Ball State created one interactive model that runs in the game engine Unity, IU School of Informatics research scientist Matthew Brennan used AutoCad and 3-D Studio Max to create a photorealistic model the team used to generate images and video clips illustrative of the research. Frischer then sought independent confirmation of the findings from Lawrence Livermore National Laboratory astrophysicist David Dearborn.

“He ran independent tests of our solar alignments, using different software and methods, and his conclusions confirmed what we had found, giving us added confidence that our discovery is correct,” Frischer said.

The work is a statement to the possibilities inherent in using information technology to support the work of archaeologists, and specifically for Frischer, the use of 3-D modeling.

“Empiricism, that sense of direct observation of nature through the senses, in some cases has had to give way to thought experiments and likewise, to computer simulations, as objects of study recede beyond our innate sensory apparatus in time, space and scale,” he said. “I call it ‘simpiricism,’ where we create computer simulations to bring our object back within the ken of the natural senses so it can be observed again, in a way analogous to what was done in the time of classic empiricism.”

“3-D modeling can show scholars and, indeed, the general public, what the archaeologist uncovered, and it can be used to provide a view of how the site or object looked when it was new and in subsequent stages of its use and destruction,” Frischer said.

This research was funded by the National Science Foundation (grant #IIS-1014956).

Please visit the site: <http://news.indiana.edu/releases/iu/2013/12/augustus-virtual-reality-project.shtml>

ANCIENT PIG-SHAPED BABY BOTTLE FOUND, BY ROSSELLA LORENZI

Italian archaeologists have discovered an ancient terracotta pig which worked as a toy as well as a modern-day baby bottle.

Known as *guttus*, the unique vessel dates back about 2,400 years, when the “heel” of Italy was inhabited by the Messapian people, a tribal group who migrated from Illyria (a region in the western part of the Balkan peninsula) around 1000 B.C.

Featuring pointy ears and human-like eyes, the pig-shaped *guttus* featured terracotta rattles in its tummy to apparently encourage the baby to sleep after the meal.

The small terracotta pig is one of several rare objects found last May in Manduria, near Taranto in Puglia, when construction work exposed a Messapian tomb.

Cut into rock, the 8- by 4-foot tomb was decorated with ocher, red and blue bands. It contained the remains of two individuals — in line with the Messapian custom of burying family members together in the same grave.

“We found some skeletal remains piled in an angle. Other remains, related to a later burial, occupied the entire tomb,” archaeologist Arcangelo Alessio of the Archaeological Superintendency of Puglia, told Discovery News

Alessio and his team recovered about 30 funerary objects, which have now been cleaned and restored. They included jars, plates, lamps, ointment vases, three baby feeding vessels and two terracotta statuettes depicting female subjects.

Objects such as a black painted basin and an iron blade of a knife suggest a male burial, while a strong clue for a female burial came from a special Messapian pottery vase called *trozzella*. Featuring four little wheels at the tops of its handle, versions of the vase are often found in the graves of Messapian women.

Parenting Lessons From the Ancient World

“Analysis of the funerary objects and their context suggest that the two burials followed one another in the Hellenistic period, between the end of the fourth and the third-second centuries B.C.,” Alessio said.

The presence of three feeding vessels would point to a third burial, possibly belonging to a newborn girl, as suggested by the two terracotta statuettes found in the tomb. Indeed, these sculptures were often placed in burials of young girls.

“We might speculate that the female individual was pregnant at the time of death,” archaeologist Gianfranco Dimitri, who followed the excavation, told Discovery News.

“It’s an intriguing hypothesis, although it is also likely that the tender baby’s bones totally decomposed over the centuries,” he added.

Please visit the site: <http://news.discovery.com/history/archaeology/ancient-pig-shaped-baby-bottle-found-131213.htm> [Go there for pict]

RESEARCHERS RECOVER GREEK AND ROMAN AUTHORS WITH A PIONEERING DATABASE OF BIBLIOGRAPHICAL CITATIONS

A research team conducted at the Department of Classical and Romanic Philology has led to the creation of a pioneering database of bibliographical citations on authors of Ancient Greece and Rome, whose works, in many cases, have not survived in full until our days. The work of the team led by Professor Lucía Rodríguez-Noriega Guillén has conducted to, for example, the discovery of previously-unknown authors, such as Odysseus, a metrologist that offers the definition of "verse", and whose existence and contributions had not been documented until now.

This is the first research that seeks to thoroughly analyze all the citations (whether literal or not) of an ample scholarly corpus, highlighting the special value of the literary tradition of the Late Antiquity. The references to other authors and their works (in literal or free citations, imitations, testimonies, etc.) detected in the 28 writers that compose the full cast of grammarians, rhetoricians and sophists of the 3rd and 4th Centuries, make up this open database. The exhaustive analysis of these materials will help to better know not only the works of the authors who are being studied, but also the contributions and the impact that the contributions of other authors had, and whose legacy has not been directly preserved until today.

The new technologies have allowed that those materials are offered freely to experts from all around the world in a website that is updated as new milestones are achieved in the project. The innovative nature of the initiative and its strategical value as a source for consultations make the portal, inaugurate last October, a future reference for the international experts on this field.

The selection of authors and period is not an accident. "Grammarians, rhetoricians and sophists are writers who very frequently quote others, especially as a model or example, and that is why, in their works, there is an abundance of testimonies and fragments from past philosopher's, poets, grammarians, orators, historians...", explains Lucía Rodríguez-Noriega Guillén. On the other hand, the Greek authors of the 3rd and 4th Centuries BCE are specially valuable to recover the works of their unknown predecessors, since the popularization, starting on the 4th Century CE, of the book as we know it today, substituting papyrus rolls, was a critical moment that led to the loss of a sizable portion of Greek and Roman literature, since it was not copied into the new format. These authors, however, were still able to access many works that would, eventually, disappear.

The research project titled "La tradición literaria griega en los ss. III-IV d.C. gramáticos, rétores y sofistas como fuentes de la literatura greco-latina", funded by the Ministry of Economy and Competitiveness, aims at documenting the indirect transmission of the works of classical authors cited by others in the aforementioned corpus of scholars. The researchers from the University of Oviedo started their labor by thoroughly analyzing the works of the selected authors. "We extract absolutely every single reference to works or authors, regardless of the type of citation they are found in, and whether their authorship

is explicitly stated or not. From there, we compose a file for each one of these citations, tracing its history from the original author to the late Byzantine period", explains the main researcher of the project.

This task of thorough analysis creates a network of relations between authors and expands the information on those who are less known for the general public. The dedicated working of tracing each citation to find its origin and presence throughout history leads to, for example, knowing that Homer is the most cited author, and to be precise, his work *The Iliad*. "Homer would be the "trending topic" of the moment", explains Lucía Rodríguez-Noriega, establishing a comparison with today. In the case of philosophers, the two most cited ones are Plato and Aristotle, in that order.

The researchers from the University of Oviedo work in collaboration with Philologists of the University of Zaragoza, who conduct their own coordinated project on *Los gramáticos latinos tardíos como fuente para el conocimiento de la tradición gramatical greco-latina*. The project also has the collaboration of researchers from the University of the Basque Country.

Research team

Lucía Rodríguez-Noriega Guillén
María José García Soler
Manuel González Suárez
Luis Alfonso Llera Fueyo
Lorena Molina Molina
Virginia Muñoz Llamosas
Javier Verdejo Manchado

RESEARCHERS USE HI-TECH METHODS TO STUDY ARCHAEOLOGICAL FINDS

As the Qatar Museums Authority celebrates the unveiling of the country's first Unesco World Heritage listed site tomorrow at Al Zubarah, a team of researchers at the Qatar Science and Technology Park are proud of their small role in uncovering the country's history.

The researchers, based at the Maersk Oil Research and Technology Centre (MO-RTC), use the latest cutting-edge technology to scan rock samples at a micro level and create images that assist in oil recovery, and now archaeology.

The MO-RTC Digital Core Laboratory is the first of its kind to operate in the Middle East and is home to the region's only electron microscope with associated QEMscan capability.

Using the techniques of computed tomography (CT) and quantitative automated mineralogy, archaeologists can compare the mineralogy of pottery sherds with that of locally sourced clays, and understand the origins of the ceramics from sites under excavation within Qatar.

Abdulrahman al-Emadi, head of MO-RTC, said research from the Digital Core Laboratory can help improve oil recovery rates but – through its role in archaeology – it's also a fantastic example of industry and academia working together for the greater good of Qatar.

The CT and quantitative automated mineralogy techniques at the MO-RTC have helped researchers discover important information on the far-reaching trade routes of the Islamic period that extended to regions far beyond the Arabian Gulf.

Evidence for this trade comes from pottery on several Islamic sites within Qatar, including the town of Al Zubarah on the north-west coast.

Theis Ivan Solling, the manager of Maersk Oil's Digital Core Laboratory, explained how the procedure is carried out: "Small sections are cut from each sherd using a diamond-bladed saw, placed in a mould, coated in epoxy resin and left to solidify for 24 hours. A thin slice is then cut from the hardened plug. It is then glued to a microscope slide and polished to an ultra-thin state. We then do experiments to map out the mineralogy in two dimensions. The section is subjected to an electron beam. The data is then treated to yield information about the mineralogy. Geologists can then identify which part of the world that particular mineral came from. It's like a fingerprint, each is unique."

In another part of the lab, CT scanning produces three-dimensional images of the structure of a pottery sample.

"A total of 13,000 images are used to make a mathematical reconstruction. This results in a file that records the spatial structure of the specimen. From the results researchers

can see how all the pores are interconnected, and this yields information not only about the production method of the sherd but also its origin,” Solling added.

Please visit the site:

<http://www.gulf-times.com/qatar/178/details/374394/researchers-use-hi-tech-methods-to-study-archaeological-finds>

STONEHENGE SOUND STUDY SUGGESTS ICONIC ROCKS WERE PICKED FOR THEIR ACOUSTIC PROPERTIES (VIDEO), BY MACRINA COOPER-WHITE

Of all the stones the ancients could have chosen to use in building Stonehenge, why did they pick those famous bluestones?

A provocative new study suggests it's because of their special acoustic qualities. The study adds a surprising twist to previous research that revealed Stonehenge may have been used as a concert venue.

For the study, researchers at the Royal College of Art in London tapped on more than 1,000 rocks in the Carn Menyn area of the Preseli Hills in southwestern Wales, the region where the iconic monument's bluestones are believed to have come from.

Researcher Paul Devereux uses percussion to test the sonic properties of a stone.

"We found it was a noteworthy soundscape, with a significant percentage of the actual rocks making metallic sounds like bells, gongs, tin drums, etc., when tapped with small, handheld 'hammerstones,'" study co-leader Paul Devereux, a research associate at the college and an expert in archaeo-acoustics, told The Huffington Post in an email.

In July, the researchers gained clearance to conduct tests on the rocks at the Stonehenge site itself. They found the stones produced "distinctive if muted sounds, suggesting that they would have probably been full 'ringers' if they had the resonant space around them," Devereux and his collaborator wrote in an article describing the study.

Markings found on the Stonehenge rocks suggest that ancient people struck them -- but it's unclear whether the people were trying to make pretty sounds or simply breaking off bits of the rocks to keep as souvenirs, the researchers said.

"The stones may have been thought to have magical, qualities, mana, because of their exceptional sonic nature," Devereux told HuffPost Science, adding that even if the stones did not produce their own "rock music," they may have been revered for their sound qualities.

The study was published Dec. 2 in the journal *Time and Mind: The Journal of Archaeology, Consciousness and Culture*.

Please visit the site: <http://www.huffingtonpost.com/2013/12/09/stonehenge-sound-rocks-acoustic-properties-video-n-4413300.html> [Go there for pix, videos, and audios; downloadable full study at: <http://www.tandfonline.com/doi/full/10.1080/1751696X.2013.860278#.UqcikfRDvRy>

EVIDENCE OF ANCIENT HUMAN HISTORY **ENCODED IN MUSIC'S COMPLEX** **PATTERNS**

In the same way that fragments of ancient pottery and bones offer valuable information about human history, music can also reveal previously hidden clues about the past, according to new research from an international team led by McMaster University psychologist Steven Brown.

The team has established for the first time that the history of human populations is embedded in music, where complex combinations of rhythm, pitch and arrangement form a code that scientists can read in a manner that can be compared to the way they read changes in human DNA and language.

"Music is an untapped migrational marker that can be used to help people understand the history of human populations," says Brown, an associate professor of Psychology, Neuroscience & Behaviour. "It adds to the whole story of human history. We need more evidence, and this is a new kind of evidence that we can add to the pot."

Brown's research team used a comparison between the mitochondrial DNA and the folk music of nine indigenous populations of Taiwan to show that each tells a similar story about the ways those populations have changed and converged over the last 6,000 years.

Mitochondrial DNA changes at a predictable rate, acting as an evolutionary clock that makes it ideal for such comparisons.

The group included researchers from Tokyo University of the Arts, the Max Planck Institute for Evolutionary Anthropology in Germany and China Medical University and Mackay Memorial Hospital, both in Taiwan.

Their results are published in *Proceedings of the Royal Society B*, one of the society's biological journals.

The researchers analyzed the structures of 220 Taiwanese choral songs recorded since the 1940s. They compared the results with DNA samples taken from 1,050 subjects from different parts of the island and found that the musical results shared significant similarities to the genetic results when it came to tracking changes over thousands of years.

The findings prove that music can be a repository of scientific information about the people who make it, says Brown, who is director of the NeuroArts Lab in McMaster's Department of Psychology.

"Languages and genes change slowly over time, but music can change much more quickly," Brown says. "I think people thought that music was too transient to carry evidence of what happened thousands of years ago. Our results support the idea that music actually has elements in it that are ancient. In addition to being able to evolve quickly, it can also retain traces of ancient population movements."

Brown's lab is devoted to understanding of the neural, cognitive and evolutionary foundations of the arts, including: music, dance, drama and the visual arts, and is associated with McMaster's Institute for Music and the Mind. Research on the project was funded by the Social Sciences and Humanities Research Council of Canada.

Please visit the site:

<http://www.sciencedaily.com/releases/2013/11/131119152816.htm>

NEW RESEARCH WILL ALLOW MORE RELIABLE DATING OF MAJOR PAST EVENTS

Academics have developed a new method which will allow key past events to be dated more accurately.

Research led by Professors Paul Blackwell and Caitlin Buck from the University of Sheffield's School of Mathematics and Statistics and Professor Paula Reimer from Queen's University Belfast has resulted in a new, internationally agreed radiocarbon calibration curve which will provide improved accuracy to archaeologists, environmental scientists and climate researchers who rely on radiocarbon dating to put their findings onto a reliable time-scale.

New method could be used to date items like a recently discovered baby mammoth in Siberia.

The release of the new curve will mean that more precise date estimates can be obtained than previously possible and will reduce uncertainty about the timing of major events in the history and development of humans, plants and animals and the environments in which they lived.

The radiocarbon calibration curve would allow researchers to reliably date everything from items like the recently excavated bones of King Richard III, to confirm they were from the right time period, to baby woolly mammoths preserved in permafrost in Siberia. It also provides reliable time-scales for those seeking to understand ancient environments, including members of the International Panel on Climate Change.

Professor Caitlin Buck, from the University of Sheffield, said: "We are proud to have developed such an important tool for archaeologists and environmental scientists, allowing them to more accurately date their findings and reduce uncertainty about the timings of major events. We're also grateful to the more than 30 other scientists who have shared data and research ideas with us to make it all possible."

Professor Paula Reimer, from Queen's University Belfast added: "This project built on research begun in the 1980s at Queen's and elsewhere and is essential for the continued utility and development of radiocarbon dating."

The release of the new curve is the culmination of five years of research funded by the Natural Environment Research Council (NERC) and more than ten years of research by the teams at Sheffield and Queen's Universities which involved collation of data from colleagues across the world, development of rigorous quality control procedures for selecting the best data, building of tailored statistical models and the writing of thousands of lines of computer code.

Additional information

The research paper is published in the current issue of the journal Radiocarbon and can be viewed in full via: <http://www.radiocarbon.org/>

Please visit the site: <http://www.sheffield.ac.uk/news/nr/new-research-will-allow-more-reliable-dating-of-major-past-events-1.331625>

SERBIAN ARCHAEOLOGIST FINDS 4,000- YEAR-OLD CHARIOT KURIR, TANJUG

During the protective archaeological works, carried out in parallel with the construction of Corridor 10, archaeologist Zoran Mitic found the remains of beautifully decorated chariot, assumed to be aged between 3,000 and 4,000 years and to have belonged to a Thracian from the elite of the time.

According to Mitic, this an unique and extremely important item, which he found near the village of Stanicenje.

“This is a chariot, drawn by two horses. My assumption is that the chariot belonged to a Thracian citizen,” Mitic told Tanjug.

He said that this is backed by the fact that, at the location where the chariot was found, was also found a tumulus – a tomb.

“Judging by the manner of burial, I guess that it was a member of Thracian people, not ordinary, but someone who occupied an important place in the hierarchy, due to the fact that the chariot is decorated with beautiful bronze applications,” he said.

Please visit the site: <http://inserbia.info/news/2013/12/serbian-archaeologist-finds-4000-year-old-chariot/> [Go there for pict]

ANCIENT CORRIDOR REVEALS ROMAN SOCIAL LIFE TRACES

A 40-meter corridor, giving clues about Roman social life 2,000 years ago has been unearthed in the ancient city of Metropolis.

Archaeologists believe these kinds of structures were used as service corridors by servants working in Roman baths. Footprints were also discovered in the area

The ancient brick-vaulted corridors were discovered in a well-preserved state, revealing aspects of social life 2,000 years ago, according to archaeologists, who also encountered the footprints of a man and a goat.

Archaeological excavations in the ancient city of Metropolis, situated in İzmir, revealed a 40-meter corridor, giving clues about life 2,000 years ago.

According to a statement by Sabancı Foundation, which supports the project together with Torbalı Municipality and the Association of Metropolis Lovers (MESEDER), a 40-meter corridor was unearthed during the excavations that have been continuing in the bathing and sports sections of the site.

The brick-vaulted corridors, which had been built parallel to the northern, western and southern walls, were discovered in a well-preserved state, revealing aspects of social life 2,000 years ago.

Archaeologists believe that these kinds of structures were used as service corridors by servants working in Roman baths. Excavations also revealed furnaces built in the same parallel with the pools of the bath.

Associate Professor Serdar Aybek, head of the excavations and the archaeology department of Celal Bayar University, said the finding unearthed from the 6,000 square-meter excavation area was a “surprise.” “It is very exciting that the structures survived to this day in such good condition,” he said.

He said it would be possible to understand all architectural structures of this structure in future excavations, adding they encountered the footprints of a man and a goat in the same excavation area. “When we saw these footprints, we imagined the days when the bath was built or restored. We think the footprints belong to a goat that entered the areas before the structure’s soil mixture dried, and a man ran after it.”

‘Value for Turkey’

The Sabancı Foundation General Director Zerrin Koyunsağan said the historic richness in Metropolis was a significant value for Turkey.

She said that every year, they have been surprised with new findings and discoveries in the ancient city of Metropolis, and every finding gave answers about social life 2,000 years ago.

In the meantime, the Metropolis site efforts, which started in 2012, are continuing in parallel with the excavations. A 16,000 square-meter area was surrounded by a fence and the projects for visitor welcome center, view terraces, walking routes and the environmental reorganizations have been finished.

The ancient city of Metropolis is located 40 kilometers away from İzmir and 45 kilometers away from the world-renowned ancient city of Ephesus. The site, which bears traces of the Classical, Hellenistic, Roman, Byzantine and Ottoman periods, has been under excavation for 23 years as a part of a project jointly carried out by the Ministry of Culture and Tourism.

Please visit the site: <http://www.hurriyetdailynews.com/ancient-corridor-reveals-roman-social-life-traces.aspx?pageID=238&nID=57852&NewsCatID=375> [Go there for pict.]

USING CUTTING-EDGE TECHNOLOGY, EUROPEAN SCIENTISTS HAVE UNCOVERED NEW FRAGMENTS BY EURIPIDES AND AN UNKNOWN ANCIENT COMMENTARY ON ARISTOTLE

These writings were on parchments that were washed off and overwritten in medieval times. Using advanced multispectral imaging methods, the Palamedes project, based out of the Universities of Göttingen and Bologna were able to see the original writings in the manuscripts, one of which is located at the library of the Greek Orthodox Patriarchate in Jerusalem, while the other can be found at the National Library of France in Paris.

The manuscript in Jerusalem originates from the famous Library of the Holy Sepulchre at Jerusalem. The uppermost text layer from the thirteenth century comprises the Prophetic Books of the Greek Old Testament, underlaid by older texts from various medieval manuscripts that contain works of Euripides and Aristotle, alongside theological tractates. “The manuscript in Jerusalem is one of the most significant witnesses to Euripides’ work”, explains the head of the research project, Felix Albrecht from Göttingen University’s Faculty of Theology. The manuscript contains the text of Euripides, surrounded by ancient annotations.

The manuscript in Paris preserves the remnants of an ancient philosophical manuscript from the late fifth century, the commentary of an unknown author on Aristotle’s work. It contains drawings of highest quality, which, due to their age, constitute important evidence for the textual tradition of philosophical commentaries. “The discovery of this work is of inestimable value for the history of philosophical education in the late antiquity”, says the discoverer of the manuscript, Dr. Chiara Faraggiana di Sarzana from Bologna University.

<http://www.palamedes.uni-goettingen.de/index.php>

The legendary Greek Palamedes was famous for his extraordinary wisdom and ingenuity. Euripides dedicated to him the lost tragedy »Palamedes«. He is the namesake of the research project PALAMEDES (PALimpsestorum Aetatis Mediae EDitiones Et Studia), which is funded by the Fritz Thyssen Foundation.

PALAMEDES is a collaboration between the universities of Göttingen and Bologna, as well as the Cultural Foundation of the National Bank of Greece (MIET) in Athens. Main partners are the Greek Orthodox Patriarchate of Jerusalem and the Bibliothèque nationale de France. In Göttingen, the project is associated with the Centrum Orbis Orientalis et Occidentalis (CORO) and the Göttingen Centre for Digital Humanities (GCDH).

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ANCIENT POLLEN TELLS STORY FROM UNDER THE SEA OF GALILEE, BY KARIN KLOOSTERMAN

Like rings on a tree, layers of pollen can tell researchers much about climate patterns unrecorded in the centuries before there was science.

New pollen samples dug out of the bottom of the Sea of Galilee (Lake Kinneret) by an Israeli scientific team suggest that a regional drought seems to have been the reason why prosperous societies — Egyptian, Hittite and Mycenaean — collapsed more than 3,000 years ago.

The recent study by Dafna Langgut and Prof. Israel Finkelstein of the Institute of Archaeology at Tel Aviv University (TAU); Prof. Thomas Litt from the University of Bonn, Germany; and Prof. Mordechai Stein from the Hebrew University appeared in the October issue of *Tel Aviv: Journal of the Institute of Archaeology of Tel Aviv University*.

The study explains short-term and cataclysmic climatic changes in the region. In addition, the new research opens up a new way for scientists to compare records and substantiate them.

Looking at pollen at the micro-scale of 40-year gaps, the researchers discovered a shift in vegetation that corresponds to a drought that heightened in the years between 1250 and 1100 BCE. This drought presumably could have created a snowball effect on trade, farming and societies themselves.

How pollen fells the mighty

What fascinates historians is the quick timescale in which these ancient centers of power disappeared from the world stage. “In a short period of time, the entire world of the Bronze Age crumbled,” says Finkelstein.

“The Hittite empire, Egypt of the Pharaohs, the Mycenaean culture in Greece, the copper-producing kingdom located on the island of Cyprus, the great trade emporium of Ugarit on the Syrian coast and the Canaanite city-states under Egyptian hegemony – all disappeared and only after a while were replaced by the territorial kingdoms of the Iron Age, including Israel and Judah.”

Finkelstein, a noted archeologist, is more pragmatic and prefers not to talk about the mysterious Sea Peoples who may have pillaged and stormed the empires in the region back then. (In fact he hung up the phone when I asked him the question: saying – “this interview is over”, when I was writing a piece for ISRAEL21c.) This is a theory suggested by his former student, Egyptologist Shirley Ben-Dor Evian.

Neither is he willing to connect the Bible’s narratives to what he finds using the tools of archeology.

Pollen, however, provides scientific evidence. Using pollen records to understand the past is not a novel idea, even in Israel where Langgut, a palynologist (pollen expert), has used pollen findings to reconstruct ancient gardens.

The most enduring organic material

Langgut, who carried out the actual studies of 20-meter-long samples drilled from 300 meters down into the heart of the Sea of Galilee – Israel’s only inland lake — says that “pollen is the most enduring organic material in nature.”

She explains: “Pollen was driven to the Sea of Galilee by wind and river-streams, was deposited in the lake and was embedded in the under-water sediments. New sediments that are added annually create anaerobic conditions which help preserve the pollen particles. These particles tell us about the vegetation that grew in the vicinity of the lake in the past and therefore testify to the climatic conditions in the region.”

The lake, with its stories, sediments, and recovered ancient fishing boats and other artifacts, can reveal much about the factors that have shaped the land of Israel.

“The novelty [of the study] is mainly in the resolution, which concentrated on a short period of time with a good control of radiocarbon dating,” Finkelstein explains.

And, he adds, the study was unique because it made use of more than one record — pollen records, archeological and textual records.

Will work like that done at the Sea of Galilee be able to shed light on the political and societal effects of advanced climate change and the world droughts that are predicted for the next hundred years and beyond? Only time will tell.

Please visit the site: <http://www.greenprophet.com/2013/12/ancient-pollen-tells-story-from-under-the-sea-of-galilee/>

UNLOCKING THE SCROLLS OF HERCULANEUM, BY ROBIN BANERJI

The British Museum's 2013 show of artefacts from the Roman cities of Pompeii and Herculaneum, buried in ash during an explosive eruption of Mount Vesuvius, was a sell-out. But could even greater treasures - including lost works of classical literature - still lie underground?

For centuries scholars have been hunting for the lost works of ancient Greek and Latin literature. In the Renaissance, books were found in monastic libraries. In the late 19th Century papyrus scrolls were found in the sands of Egypt. But only in Herculaneum in southern Italy has an entire library from the ancient Mediterranean been discovered in situ.

On the eve of the catastrophe in 79 AD, Herculaneum was a chic resort town on the Bay of Naples, where many of Rome's top families went to rest and recuperate during the hot Italian summers.

It was also a place where Rome's richest engaged in a bit of cultural one-upmanship - none more so than Lucius Calpurnius Piso Caesoninus, a politician and father-in-law of Julius Caesar.

In Herculaneum, Piso built a seaside villa on a palatial scale - the width of its beach frontage alone exceeds 220m (721ft). When it was excavated in the middle of the 18th Century, it was found to hold more than 80 bronze and marble statues of the highest quality, including one of Pan having sex with a goat.

When he came to plan his own exercise in cultural showing off, J Paul Getty chose to copy Piso's villa for his own Getty museum in Malibu, California.

Piso's grand villa, which has come to be known as the Villa of the Papyri, also contains the only library to have survived from the classical world. It is a relatively small collection, some 2,000 scrolls, which the eruption nearly destroyed and yet preserved at the same time.

A blast of furnace-like gas from the volcano at 400C (752F) carbonised the papyrus scrolls, before the town was buried in a fine volcanic ash which later cooled and solidified into rock.

When excavators and treasure hunters set about exploring the villa in the 18th Century, they mistook the scrolls for lumps of charcoal and burnt logs. Some were used as torches or thrown on to the fire.

But once it was realised what they were - possibly because of the umbilicus, the stick at the centre of the scrolls - the challenge was to find a way to open them.

Some scrolls were simply hacked apart with a butcher's knife - with predictable and lamentable results. Later a conservator from the Vatican, Father Antonio Piaggio (1713-

1796), devised a machine to delicately open the scrolls. But it was slow work - the first one took around four years to unroll. And the scrolls tended to go to pieces.

The fragments pulled off by Piaggio's machine were fragile and hard to read. "They are as black as burnt newspaper," says Dirk Obbink, a lecturer in Papyrology at Oxford University, who has been working on the Herculaneum papyri since 1983.

Under normal light the charred paper looks "a shiny black" says Obbink, while "the ink is a dull black and sort of iridescens".

Reading it is "not very pleasant", he adds. In fact, when Obbink first began working on them in the 1980s the difficulty of the fragments was a shock. On some pieces, the eye can make out nothing. On others, by working with microscopes and continually moving the fragments to catch the light in different ways, some few letters can be made out.

Meanwhile, the fragments fall apart. "At the end of the day there would be black dust on the table - the black dust of the scroll powdering away. I didn't even want to breathe."

This all began to change 15 years ago.

In 1999, scientists from Brigham Young University in the US examined the papyrus using infrared light. Deep in the infrared range, at a wavelength of 700-900 nanometres, it was possible to achieve a good contrast between the paper and the ink. Letters began to jump out of the ancient papyrus. Instead of black ink on black paper, it was now possible to see black lines on a pale grey background.

Scholars' ability to reassemble the texts improved massively. "Most of our previous readings were wrong," says Obbink. "We could not believe our eyes. We were 'blinded' by the real readings. The text wasn't what we thought it was and now it made sense."

In 2008, a further advance was made through multi-spectral imaging. Instead of taking a single ("monospectral") image of a fragment of papyrus under infrared light (at typically 800 nanometres) the new technology takes 16 different images of each fragment at different light levels and then creates a composite image.

With this technique Obbink is seeking not only to clarify the older infrared images but also to look again fragments that previously defied all attempts to read them. The detail of the new images is so good that the handwriting on the different fragments can be easily compared, which should help reconstruct the lost texts out of the various orphan fragments. "The whole thing needs to be redone," says Obbink.

So what has been found? Lost poems by Sappho, the 100-plus lost plays of Sophocles, the lost dialogues of Aristotle? Not quite.

Despite being found in Italy, most of the recovered material is in Greek. Perhaps the major discovery is a third of *On Nature*, a previously lost work by the philosopher Epicurus.

But many of the texts that have emerged so far are written by a follower of Epicurus, the philosopher and poet Philodemus of Gadara (c.110-c.40/35BC). In fact, so many of his

works are present, and in duplicate copies, that David Sider, a classics professor at New York University, believes that what has been found so far was in fact Philodemus's own working library. Piso was Philodemus's patron.

Not all of the villa's scrolls have been unrolled though - and because of the damage they suffer in the unwinding process that work has now been halted. Might it be possible to read them by unrolling them not physically, but virtually?

In 2009 two unopened scrolls from Herculaneum belonging to the Institut de France in Paris were placed in a Computerised Tomography (CT) scanner, normally used for medical imaging. The machine, which can distinguish different kinds of bodily tissue and produce a detailed image of a human's internal organs could potentially be used to reveal the internal surfaces of the scroll.

The task proved immensely difficult, because the scrolls were so tightly wound, and creased.

"We were able to unwrap a number of sections from the scroll and flatten them into 2D images - and on those sections you can clearly see the structure of the papyrus: fibers, sand," says Dr Brent Seales, a computer science professor at the University of Kentucky, who led the effort.

But the machine could not distinguish "the chemistry of the ink from the chemistry of the paper," he says. It is unfortunate that ancient ink contains no metal.

Seales is continuing to analyse the data produced by the 2009 scan. He has also begun testing a new way of reading the scrolls, using a beam from a particle accelerator.

Others are more preoccupied with the idea that there may be more scrolls in the villa waiting to be discovered.

Richard Janko, professor of classical studies at the University of Michigan is "pretty certain that there's more there".

The villa belonged to Latin-speaking Roman aristocrats, Lucius Calpurnius Piso and his son of the same name - so, Janko reasons, there would have been a Latin library as well as the mostly Greek library already discovered.

Secondly, the villa was, he says, not merely a holiday home but a mouseion—a museum-like place to show off a collection of spectacular works of art and literature. If this mouseion had literature to compare to its sculptures, we should expect something more impressive than the working collection of a minor philosopher such as Philodemus.

We might even hope for an early edition of the Aeneid, as Virgil and Philodemus knew each other.

Thirdly, scrolls were found in various places in the villa. Although some were on shelves and in cabinets, others were piled on the ground and packed in the tubular boxes (capsae) in which scrolls were carried around. Could these boxes have been brought from another part of the building, as yet unknown, where further scrolls remain still?

Robert Fowler, professor of classics at Bristol University, points out that near the room where many of the scrolls were found, and on the same level, is a section of the villa that has never been dug up.

The Swiss engineer Karl Weber, who led the dig of the villa in the 1750s "was defeated by the nature of the material in the site next to where the scrolls were found," he says.

And the villa also has three levels. Only the topmost has been substantially explored so far, but in the 1990s two other layers were partially revealed. In the middle floor, archaeologists have discovered a range of well-furnished rooms with views out to sea, some of which have been opened up while others remain closed. Could this be where the villa's owners kept their good stuff?

So far, all we have are guesses. Only digging will provide proof. But Fowler remains hopeful that the villa could yet contain a literary "bonanza". Someday, he is sure, we shall be able to re-read the ancient scrolls.

The Italian authorities are reluctant to permit further excavation, arguing that this would be disruptive for residents of the modern town of Ercolano, built literally on top of Herculaneum. They also point out that 300-400 of the original rolls remain unread.

In the meantime Fowler tries to keep up the pressure. He reckons that we have perhaps 10% of the great works of classical literature, so any chance to recover the rest is precious.

"Just imagine if there were two plays by Shakespeare which we knew of but had never read and which we believed lay underground in a particular place: do you think we would question the decision to dig them up? Do you think we would be hesitating?"

And if we did need another reason for speed, there is always the volcano. Mount Vesuvius has erupted a dozen times in the last 200 years, the last major eruption in 1944. As Richard Janko says, another big eruption might end our chance of recovering the ancient literature in Herculaneum for ever.

Please visit the site: <http://www.bbc.co.uk/news/magazine-25106956> [Go there for many illustrations]
