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Κάνιγγος 27, 106 82 Αθήνα
(Ένωση Ελλήνων Χημικών)
http://archaeometry.org.gr/index.php/en/

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Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Δεκέμβριος 2017 -

It is during our darkest moments that we must focus to see the light. (*Aristotle*)

Newsletter of the Hellenic Society of Archaeometry

- December 2017 -

Nr. 201

ΠΙΝΑΚΑΣ ΠΕΡΙΕΧΟΜΕΝΩΝ – TABLE OF CONTENTS

ΣΥΝΕΔΡΙΑ – CONFERENCES/WORKSHOPS

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ – JOB VACANCIES/FELLOWSHIPS

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

METALLOGRAPHY AND MICROSTRUCTURE, A SUMMER SCHOOL COURSE IN ANCIENT AND HISTORIC METALS, UNIVERSITY OF BRIGHTON, HASTINGS CAMPUS, HAVELOCK STREET, HASTINGS, EAST SUSSEX. MONDAY JULY 2ND-FRIDAY 6TH JULY 2018

This week-long course is designed to introduce or further develop knowledge of the microstructure of ancient metals and the practical application of metallography. Using prepared samples from the most extensive collection of mounted ancient metals in the world, course participants will learn how to sample, mount, polish, etch and interpret microstructural features.

The geographical spread of metals studied during the course encompasses: ancient Greece, Rome, European Bronze Age, Bronze Age China (Warring States to Tang in fact), Africa, Colombia, Peru, Ecuador, England and Ireland. Lectures on a variety of case studies are included. A lecture on the Wealden Iron Industry will be given by Jeremy Hodgkinson.

The location of the course in the centrally located Hastings campus of the University of Brighton, is a popular seaside destination with many cultural attractions including the Jerwood Gallery and various Museums.

Fee for course is 400 pounds sterling. Early booking is advisable due to the holiday trade in the summer months. There are many Airbnb, bed-and-breakfast choices and hotels in the area.

Booking: for booking up the course in 2018 please send an e-mail to: dascott@ucla.edu.

Instructor: Distinguished Professor Emeritus, David A. Scott, is the former head of the Museum Research Laboratory, J. Paul Getty Museum, Malibu. Professor in the Department of Art History, UCLA, and Founding Director of the UCLA/Getty Conservation Programme. His 2002 book, Copper and Bronze in Art: Corrosion, Conservation, Colourants, won the award for the best Art/Scholarly book published in the USA in 2002. His latest book is Art: Authenticity, Restoration, Forgery, published in 2016. Professor Scott is the author of over 135 peer-reviewed papers and eight books.

ΕΓΚΥΚΛΙΟΣ ΓΙΑ ΤΟ 38Ο ΣΥΜΠΟΣΙΟ ΒΥΖΑΝΤΙΝΗΣ ΚΑΙ ΜΕΤΑΒΥΖΑΝΤΙΝΗΣ ΑΡΧΑΙΟΛΟΓΙΑΣ ΚΑΙ ΤΕΧΝΗΣ, ΑΘΗΝΑ, 11 ΕΩΣ 13 ΜΑΪΟΥ 2018

Το 38ο Συμπόσιο Βυζαντινής και Μεταβυζαντινής Αρχαιολογίας και Τέχνης της Χριστιανικής Αρχαιολογικής Εταιρείας θα πραγματοποιηθεί στην Αθήνα **από 11 έως 13 Μαΐου 2018.**

Το ειδικό θέμα που θα απασχολήσει το 38ο Συμπόσιο της ΧΑΕ κατά τη μία από τις τρεις ημέρες της διάρκειάς του είναι: **«Αναζητώντας τη θέση του «άλλου» στο Βυζάντιο: υλικά τεκμήρια και καλλιτεχνικές εκφάνσεις της παρουσίας αλλόφυλων και αλλόθρησκων στη βυζαντινή επικράτεια».**

Η βυζαντινή κοινωνία, αν και πολυσυλλεκτική ως προς τη σύνθεση του πληθυσμού της, παρουσίαζε ισχυρή συνοχή χάρη στην ορθόδοξη πίστη, την ελληνική γλώσσα και παιδεία και την αντίληψη σχετικά με την οικουμενική σημασία και τη μοναδικότητα της χριστιανικής ρωμαϊκής αυτοκρατορίας. Ωστόσο, μέσα στη βυζαντινή επικράτεια έπρεπε να συνυπάρξουν για μικρά ή μεγάλα διαστήματα πληθυσμοί και πρόσωπα που ήλθαν ως επιδρομείς, μισθοφόροι, επισκέπτες, προσκυνητές, πρόσφυγες, έμποροι, επαγγελματίες και άλλοι που διαφοροποιούνταν θρησκευτικά, γλωσσικά, πολιτιστικά ή ιδεολογικά: Ιουδαίοι, Γεωργιανοί, Αρμένιοι, Γότθοι, Σλάβοι, Άβαροι, Άραβες, Βάραγγοι, Σελτζούκοι και Οθωμανοί Τούρκοι, Νορμανδοί, Βενετοί, Καταλανοί καθώς και Παυλικιανοί, Βογόμιλοι κ.ά.

Στόχος του ειδικού θέματος του Συμποσίου είναι να ερευνηθεί το αποτύπωμα του «άλλου» στον υλικό πολιτισμό και την καλλιτεχνική παραγωγή, προκειμένου να καταστεί δυνατή η αξιολόγηση του υλικού αυτού και η συμβολή του στη γνώση της συνύπαρξης με το στοιχείο του «άλλου». Θα διαφωτιστούν επίσης οι διαδικασίες αφομοίωσης ή εσκεμμένου αποκλεισμού ή διαχωρισμού του «άλλου» στη βυζαντινή κοινωνία.

Θεματικές της αρχαιολογίας του «άλλου» θα μπορούσαν να αποτελέσουν:

- Η αρχιτεκτονική των λατρευτικών χώρων των άλλων θρησκευτικών κοινοτήτων (συναγωγές, τεμένη, λατινικοί ναοί πριν από τη σταυροφορική κατάκτηση)
- Η υϊοθέτηση ξένων στοιχείων στη βυζαντινή αρχιτεκτονική και ο ρόλος φυλετικών ομάδων (π.χ. άραβες αιχμάλωτοι ως κτίστες)
- Η παρουσία του «άλλου» στη μνημειακή ζωγραφική, στα χειρόγραφα και στις εικόνες
- Η παρουσία του «άλλου» στη γλυπτική
- Η παρουσία του «άλλου» στη μικροτεχνία
- Αρχαιολογικά κατάλοιπα εγκαταστάσεων αλλόφυλων και αλλόθρησκων πληθυσμιακών ομάδων
- Επιγραφικές μαρτυρίες της παρουσίας αλλόγλωσσων ομάδων και προσώπων
- Δείγματα οπλισμού και εργαλείων που συνδέονται με μη βυζαντινούς πληθυσμούς
- Οι ταφικές πρακτικές των άλλων θρησκευτικών κοινοτήτων.

Εκτός από τις γενικές εισηγήσεις τις οποίες θα αναθέσει η Οργανωτική Επιτροπή σε συναδέλφους με σχετική εξειδίκευση, θα γίνουν την ίδια ημέρα και οι συναφείς με το ίδιο θέμα ανακοινώσεις.

Υπενθυμίζεται ότι οι ανακοινώσεις του *38ου Συμποσίου της ΧΑΕ,* τόσο οι ελεύθερες όσο και της ημερίδας, θα πρέπει να είναι πρωτότυπες και να αποτελούν ουσιαστική συμβολή στην επιστήμη. Η διάρκειά τους δεν μπορεί να υπερβαίνει τα 15΄ λεπτά της ώρας. Τα θέματα των ανακοινώσεων πρέπει να εντάσσονται στο πλαίσιο της βυζαντινής και μεταβυζαντινής αρχαιολογίας και τέχνης. Σύμφωνα με απόφαση του Διοικητικού Συμβουλίου, δεν θα γίνονται δεκτές ανακοινώσεις των οποίων το περιεχόμενο αναφέρεται σε μνημεία νεότερα του 1830. Αποκλείεται η περίπτωση της συμμετοχής με δύο ανακοινώσεις, ακόμα και αν η μία από αυτές είναι σε συνεργασία με άλλον ομιλητή.

Λόγω του μεγάλου αριθμού αιτήσεων συμμετοχής στο *Συμπόσιο της ΧΑΕ*, το Διοικητικό Συμβούλιο ενθαρρύνει τους ενδιαφερόμενους, κυρίως όσους σκοπεύουν να παρουσιάσουν ανασκαφές, αναστηλωτικά έργα και συντήρηση μνημείων και έργων τέχνης να χρησιμοποιήσουν τον εναλλακτικό τρόπο παρουσίασης των ανακοινώσεών τους με τη μορφή αναρτημένων πινακίδων. Οι συμμετέχοντες θα αναλάβουν τη διαμόρφωση και υλοποίηση των πινακίδων, διαστάσεων 60x85 εκ. (A1), ενώ την ανάρτησή τους σε ειδικά διαμορφωμένο χώρο θα αναλάβει η Οργανωτική Επιτροπή. Οι πινακίδες θα πρέπει να παραδοθούν στην Οργανωτική Επιτροπή το πρωί της παραμονής της έναρξης του Συμποσίου. Κατά τη διάρκεια του Συμποσίου θα προβλεφθεί χρόνος για την παρουσίαση των θεμάτων στο κοινό. Σημειώνεται ότι κατά την κατάθεση της αίτησης συμμετοχής θα πρέπει να δηλωθεί αν αφορά ανακοίνωση με τη μορφή αναρτημένης πινακίδας.

Η γλώσσα του Συμποσίου είναι η ελληνική. Ξένοι ομιλητές μπορούν να μιλήσουν σε αγγλική ή γαλλική γλώσσα.

Όπως και στα προηγούμενα Συμπόσια, προβλέπεται η έγκαιρη δημοσίευση συνοπτικών περιλήψεων των εισηγήσεων, των ανακοινώσεων και των αναρτημένων πινακίδων. Η δημοσίευση αυτή έχει το χαρακτήρα της πρώτης παρουσίασης με σκοπό την προκαταρκτική ενημέρωση. Μαζί με τις δηλώσεις συμμετοχής οι ενδιαφερόμενοι θα πρέπει να στείλουν τις περιλήψεις των ανακοινώσεών τους χωρίς υποσημειώσεις ή βιβλιογραφία, στις οποίες μπορούν να ενταχθούν μόνον μικρά γραμμικά σχέδια ακολουθώντας τις παρακάτω προδιαγραφές:

 Το όνομα του ομιλητή (επίθετο, βαπτιστικό) και ο τίτλος της ανακοίνωσης θα προηγούνται με κεφαλαία γράμματα.
 Τα κείμενα των περιλήψεων δεν πρέπει να περιλαμβάνουν λιγότερες από 250 λέξεις και οπωσδήποτε όχι περισσότερες από 500 λέξεις. Στις περιπτώσεις που εντάσσονται 1 ή 2 μικρά γραμμικά σχέδια, τότε τα κείμενα δεν πρέπει να ξεπερνούν τις 400 ή να έχουν λιγότερες από 250 λέξεις.
 Προτεινόμενη γραμματοσειρά: Times New Roman, 12΄, διάστιχο 1,5.
 Στο τέλος της περίληψης να δηλώνεται η ιδιότητα του ομιλητή, καθώς και η ηλεκτρονική και ταχυδρομική του διεύθυνση.

Το Διοικητικό Συμβούλιο της Χριστιανικής Αρχαιολογικής Εταιρείας και ειδικότερα η Οργανωτική Επιτροπή του *38ου Συμποσίου της ΧΑΕ* αποτελούμενη από τους Σοφία Καλοπίση-Βέρτη, Μαρία Παναγιωτίδη-Κεσίσογλου, Δημήτριο Αθανασούλη, Αναστάσιο

Αντωνάρα και Γεώργιο Πάλλη, επιφυλάσσεται να προτείνει αλλαγές ή να αποκλείσει ανακοινώσεις οι οποίες:

- δεν άπτονται των πεδίων της βυζαντινής και μεταβυζαντινής αρχαιολογίας και τέχνης
- δεν πληρούν τις προϋποθέσεις πρωτοτυπίας και συμβολής στην επιστήμη
- περιλαμβάνουν προσωπικές επιθέσεις
- κατατίθενται εκπρόθεσμα

Οι δηλώσεις συμμετοχής μαζί με τις περιλήψεις θα πρέπει να σταλούν στην ηλεκτρονική διεύθυνση της ΧΑΕ: **chae1884@gmail.com.**

Δηλώσεις συμμετοχής συνοδευμένες από τις περιλήψεις θα γίνονται δεκτές έως και την Τετάρτη 7 Μαρτίου 2018.

Η Πρόεδρος Η Γενική Γραμματέας

Σοφία Καλοπίση-Βέρτη Μαρία Παναγιωτίδη-Κεσίσογλου

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ΠΛΗΡΟΦΟΡΙΕΣ
Γραμματεία του Συμποσίου της ΧΑΕ (κ. Ιωάννα Μπαλλά), τηλ. 213 213 9556, τις ημέρες Τρίτη, Πέμπτη και Παρασκευή 10:00-15:00

Η αξία του τεύχους με το πρόγραμμα και τις περιλήψεις του Συμποσίου έχει ορισθεί στο ποσό των 15,00 €.

Η συνδρομή των μελών της ΧΑΕ για το 2018 έχει ορισθεί στο ποσό των 30,00€. Η καταβολή της συνδρομής θα γίνεται, όπως πάντοτε, κατά τη διάρκεια του Συμποσίου.

Όσοι επιθυμούν να εγγραφούν στον ηλεκτρονικό κατάλογο αλληλογραφίας της ΧΑΕ παρακαλούνται να αποστείλουν την ηλεκτρονική τους διεύθυνση στη **chae1884@gmail.com**

FORTHCOMING SHORT COURSE AT THE UNIVERSITY OF SHEFFIELD, 17TH-19TH JANUARY 2018

Dear all,

I hope you don't mind me posting this as it may be of interest to some of you.

The Zooarchaeology Team of the University of Sheffield would like to let you know that there are still some places available for our 'Understanding Zooarchaeology I' short course.

'Understanding Zooarchaeology I' short course (17th-19th January 2018) is directed to students, professionals and enthusiasts and does not require any previous knowledge of the discipline.

Animal bones and teeth are among the most common remains found on archaeological sites, and this three-day course will provide participants with an understanding of the basic methods that zooarchaeologists use to understand animal bone evidence. During this course participants will begin to develop the skills necessary to: understand the principles of excavating animal bones; care for and store bones after excavation; identify different species from their bones and teeth; age and sex bones; recognize taphonomy, butchery and pathology; understand how zooarchaeological material is analysed and quantified; interpret site reports and zooarchaeological literature. The teaching will be delivered through short lectures, hands-on practical activities and case studies.

Prices are as follows:
£180 (standard rate)/£120 (student/unwaged rate)

You can contact us at: zooarch-shortcourse@sheffield.ac.uk

For further information please see:
https://www.shef.ac.uk/archaeology/research/zooarchaeology-lab/short-course

Follow us on Facebook at:
https://www.facebook.com/Sheffield-Zooarchaeology-Short-Course-100619023380021/?ref=hl

and on Twitter at:
https://twitter.com/ZooarchLabSheff

NB This course is not aimed at professional and/or experienced zooarchaeologists. We would be grateful if you could spread the news, as you may know of people who may be interested. Apologies for cross-posting.

Please also note that this course is not run for profit but as educational tools. If any income is generated is reused to enhance our facilities, which are fully available for the use of the general public, at no charge.

With best wishes,

The Sheffield Zooarchaeology Team

INTERNATIONAL SYMPOSIUM "UNGUENTARIUM. A TERRACOTTA VESSEL FORM AND OTHER RELATED VESSELS IN THE HELLENISTIC, ROMAN AND EARLY BYZANTINE MEDITTERRANEAN", MAY 17-18, 2018, DOKUZ EYLUL UNIVERSITY (DEU), IZMIR, TURKEY

The Izmir Center of the Archaeology of Western Anatolia (EKVAM) is organizing an international symposium entitled "Unguentarium. A terracotta vessel form and other related vessels in the Hellenistic, Roman and early Byzantine Meditterranean" that will take place on May 17-18, 2018 at the Dokuz Eylul University (DEU) in Izmir, Turkey.

An unguentarium is a small ceramic or glass bottle, found in relatively large quantities in the entire Mediterranean, from Spain to Syria and Egypt to France, where they were produced from the early Hellenistic to the early Medieval periods. In this symposium we only focus on terracotta unguentaria between c. mid fourth century B.C. and mid sixth century A.D., and attempt to set out a comprehensive model for the study of terracotta unguentaria, including their definition, typology, chronology, contexts, function, regional characteristics, and distribution patterns in the whole Mediterranean geographies, including eastern Mediterranean, Roman provinces in the western Mediterranean, north of Alps (Germania and Britannia etc.) and north Africa.

We warmly invite contributions by scholars and graduate students from a variety of disciplines of ancient studies related to this vessel form. The symposium is free of charge. A post-symposium excursion is planned on May 19-21 to Lesbos, Greece through Ayvalik. We would be delighted, if you could consider contributing to our symposium and contact us with the required information below before January 1, 2018.
Our e-mail address are: gulserenkan@hotmail.com or terracottas@deu.edu.tr

We kindly request that you alert any persons within your research community who would be interested in participating at this symposium, either by forwarding our e-mail, or by printing this circular or poster and displaying it in your institution. We hope that you will be able to join us at the Dokuz Eylül University, and look forward to seeing you in Izmir!

We wonder, if we could ask you to advertise to your constituency the publication of the Lydia Symposium by the Presses Universitaires de Franche-Comte in France in 2019. Please note that deadline for the papers' submission is January 1, 2018 and you are welcome to submit a paper to us:
https://independent.academia.edu/TheLydiaSymposium.

INART 2018 CONFERENCE, THIRD ANNOUNCEMENT AND CALL FOR ABSTRACTS, PARMA (ITALY), MARCH 26-29, 2018

Registration is open!
Dear Colleagues, we are pleased to invite you to attend the 3rd International Conference on Innovation in Art Research and Technology (inArt 2018). The conference is open to chemists, physicists, geologists, art historians, restorers, archaeologists, etc. to create a wide community and a common environment for a fruitful discussion. The Conference scope is to create a bridge of communication between interdisciplinary units in the field of archaeometry.

Abstracts Submission Extended:
the deadline for the abstract submission has been postponed to **November 30th.**
You have more time to prepare your abstract for an oral or poster presentation during inArt 2018. Abstracts can be submitted according to the instructions available on the conference website, www.inart2018.unipr.it. Each participant can submit a maximum of two abstracts.

Special Prize!
Journal of Cultural Heritage decided to assign a special prize for young scientists presenting the best oral contribution and the best poster during inArt 2018 conference.

Publications:
on the occasion of inArt2018 conference, a special *focus point* of European Physics Journal Plus (EPJ Plus – Springer - https://epjplus.epj.org/) will be published.

Venue:
the conference will take place in Parma (Italy), in the historical building of the University. A special session on contemporary art will be held at *Centro Studi e Archivio della Comunicazione* www.csacparma.it) in the beautiful Valserena abbey, hosting a very important collection of contemporary art, photography, fashion and design.

Programme:
a first draft of the scientific and social programme is reported here:

Invited Speakers:
Lucia Burgio, Victoria & Albert Museum, London
“Scientific analysis foundation of the multidisciplinary project The Leman Album: an enhanced facsimile“

Federica Fernandez, Euro Mediterranean Institute for Science and Technology, Palermo
“Nanomaterials contribution to a more sustainable conservation of Cultural Heritage“

Maria Jesus Mosquera, Universidad de Cádiz

"Innovative Materials for the Conservation of Stone & Concrete-based Cultural Heritage"

Please, visit and share the **conference page on facebook**:
www.facebook.com/InArt2018-290153628085605/

For more information:
Danilo Bersani
University of Parma
Department of Mathematical, Physical and Computer Sciences
Parco Area delle Scienze, 7/a, 43124 Parma – Italy
www.inart2018.unipr.it
inart2018@unipr.it

SCIENTIFIC WORKSHOP "LOW ENERGY BEAMS IN BASIC RESEARCH AND APPLICATIONS", DECEMBER 15TH AND 16TH, 2017, SCUOLA NAZIONALE DELL'AMMINISTRAZIONE, VIALE GIULIO DOUHET, 81100 CASERTA CE, ITALY

Dear All,

on November 1st 2017 Filippo Terrasi will retire from official academic activity. To honor his career we have organized a scientific workshop titled *"Low Energy beams in basic research and applications"* to be held on December 15th and 16th, 2017.

The appointed venue is "Scuola Nazionale dell'Amministrazione", Viale Giulio Douhet, 81100 Caserta CE, Italy.

Attendance will be limited to 120 participants, the maximum allowed by the size of the conference hall.

More details will be provided soon, in the meanwhile mark the dates on your calendar.

Until then,

The organizing committee.

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Fabio Marzaioli, Ph.D.
Researcher in Applied Physics
Università degli Studi della Campania "Luigi Vanvitelli" (former Seconda Università di Napoli)
Department of Mathematics and Physics
Centre for Isotopic Research on Cultural and Environmental heritage
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Fax: +390823274605

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POSTGRADUATE ZOOARCHAEOLOGY FORUM (PZAF), 27TH-29TH JUNE, 2018, PALERMO, SICILY, ITALY

Dear all,

The next Postgraduate ZooArchaeology Forum (PZAF) will take place between the 27th and 29th June 2018 in Palermo (Sicily, Italy).

The PZAF is an ICAZ affiliated group run by and for postgraduate students and early-career professionals in the field of zooarchaeology, and provides the opportunity for young researchers to present their projects in an informal environment. Applications are welcome from students at any postgraduate level as well as from early-career professionals who already completed their studies.

Abstracts from any field of zooarchaeology will be considered, and can be submitted through the PZAF 2018 website https://www.pzaf.org/. The deadline for abstract submission is on 31st March 2018. For any information on the conference, please visit https://www.pzaf.org/ or email pzaf2018@gmail.com. Updates and useful information can also be found on our Facebook page https://www.facebook.com/pzaf2018/.

Please feel free to circulate this email to whoever might be interested.

Best wishes,

The PZAF 2018 organising committee

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ – JOB VACANCIES/FELLOWSHIPS

UNIVERSITY OF OKLAHOMA NORMAN CAMPUS: COLLEGE OF ARTS AND SCIENCES: LIBRARY AND INFORMATION STUDIES, DIGITAL HUMANITIES COMPUTING, OPEN RANK

Location: Norman, Oklahoma

The College of Arts and Sciences at the University of Oklahoma seeks an innovative scholar in digital humanities/humanities computing for an open rank, tenured/tenure track faculty position. This search is part of a cluster hire in the new Data Scholarship Program (DSP). The humanities component of the position is open, so candidates from a broad range of humanities and humanities-related disciplines are encouraged to apply. The position will begin in August 2018.

The incumbent is expected to become a leader within a vibrant community of humanists and other researchers using computational tools. A successful candidate in this position will play an integral role in the development of the DSP. This initiative connects researchers from diverse scholarly domains for collaboration via common approaches and for improvement of educational opportunities and research support. The incumbent will take a leadership role in curriculum and research development for this cross-disciplinary program and contribute to teaching of undergraduate and graduate students in the Data Scholarship Program and the home department(s). Humanities researchers at OU are allied through the Humanities Forum (http://www.ou.edu/humanitiesforum.html), which among many other activities has regularly hosted a Digital Humanities Symposium featuring local and national leaders in Digital Humanities. In addition, digital humanists are supported and connected through the award-winning staff of the Digital Scholarship Lab, who help to forge collaborations among researchers across the disciplines. Such connections include those with faculty from the College of Engineering who teach in the rapidly growing, Data Science and Analytics M.S. program (datascience.ou.edu).

Salary
The salary is competitive and is commensurate with qualifications and experience. The University of Oklahoma offers an excellent benefits program. For further information please access the HumanResources website at http://hr.ou.edu/.

The University of Oklahoma (OU) is a Carnegie-R1 comprehensive public research university known for excellence in teaching, research, and community engagement, serving the educational, cultural, economic and health-care needs of the state, region, and nation from three campuses: Norman, Health Sciences Center in Oklahoma City and the

Schusterman Center in Tulsa. OU enrolls over 30,000 students and has more than 2700 full-time faculty members in 21 colleges.

In 2014, OU became the first public institution ever to rank #1 nationally in the recruitment of National Merit Scholars, with 311 scholars and now boasts a 92% student retention rate. The University is home to the History of Science Collection, the Western History Collection, and renowned natural history and art museums. The 277-acre Research Campus in Norman was named the No. I research campus in the nation by the Association of Research Parks in 2013.

The University of Oklahoma's beautiful, bustling campus is nestled in the heart of Norman, the state's third largest city, located just south of Oklahoma City. Norman combines the charm of a college town, the sophistication of a cosmopolitan city and the history and culture of the American West. With outstanding schools, amenities, and a low cost of living, Norman is a perennial contender on the "Best Places to Live" rankings. With a cost of living close to 15 percent less than the national average, Norman is a very affordable city. In fall 2014, *Time* ranked Norman the "least expensive city to raise children." For more information visit: http://soonerway.ou.edu and http://www.ou.edu/flipbook

Qualifications

Required Qualifications

- A doctoral degree in a humanities, information science, or related discipline.
- An active and productive research program.
- Experience with computational tools and methods for analyzing and visualizing data.

Preferred Qualifications

- Knowledge and skills essential to digital humanities computing project development and completion, including but not limited to skills related to developing and managing datasets, data modeling and structuring, data analysis and visualization, and/or mining textual, visual, or aural data.
- Evidence of excellence in teaching that engages students in digital humanities interpretation and humanities computing skill development.
- A sustained research program and a record of top-tier, peer-reviewed or other high-impact scholarly publication.
- Experience with collaborative, cross-disciplinary research and a record of extramural funding.
- Leadership in research, instruction, and/or service.

Application Instructions

Applications should be submitted to http://apply.interfolio.com/46095 on ByCommittee and should include a curriculum vitae; three letters of reference; a statement of research interests and how the candidate would contribute to research and teaching in the development of a data scholarship program. Review of applications will begin December 1, 2017, and will continue until the position is filled. Questions about the position may be directed to the chair of the search committee, Dr. June Abbas at jmabbas@ou.edu.

This institution is using Interfolio's Faculty Search to conduct this search. Applicants to this position receive a free Dossier account and can send all application materials, including confidential letters of recommendation, free of charge.
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The University of Oklahoma, in compliance with all applicable federal and state laws and regulations does not discriminate on the basis of race, color, national origin, sex, sexual orientation, genetic information, gender identity, gender expression, age, religion, disability, political beliefs, or status as a veteran in any of its policies, practices, or procedures. This includes, but is not limited to: admissions, employment, financial aid, housing, services in educational programs or activities, or health care services that the University operates or provides.

Please visist the site: https://apply.interfolio.com/46095

TENDER OPPORTUNITY - CAREERS IN HERITAGE SCIENCE: OPPORTUNITIES AND CONSTRAINTS

The National Heritage Science Forum (NHSF) is looking to commission research into pathways into postgraduate training and careers in heritage science. The Careers in Heritage Science project aims to provide insight into why students choose whether or not to pursue post-graduate training and careers in heritage science, and what happens to young researchers following the completion of their studies. We want to understand how heritage science is perceived by training providers, employers and those starting out in their careers.

The project will gather labour market intelligence through surveys and interviews with these three groups. The results will inform NHSF actions and strategies to grow and sustain the heritage science workforce, to meet the future needs of cultural heritage in light of Brexit and major national infrastructure projects.

Applicant information:

The full project brief is available at: http://www.heritagescienceforum.org.uk/documents/NHSF_Careers__Brief_Final_2017_11_03_v1.pdf

Questions about the tender can be submitted until 12 noon on the 20 November 2017; the deadline for applications is 4 December 2017. All applicants should be informed of the outcome by the 10 January 2018.

Completed applications should be sent to administrator@heritagescienceforum.org.uk

MALCOLM H. WIENER LABORATORY FOR ARCHAEOLOGICAL SCIENCE FUNDING OPPORTUNITIES

The Malcolm H. Wiener Laboratory for Archaeological Science Announces Funding Opportunities

The Malcolm H. Wiener Laboratory for Archaeological Science of the American School of Classical Studies at Athens currently offers two different types of Fellowship funding: a pre-doctoral or post-doctoral Research Associate position of up to nine months, and a three-year post-doctoral fellowship. Applicants are welcome from any college or university worldwide. Independent scholars are also welcome to apply.

Priority will be given to question-driven research projects that address substantive problems through the application of interdisciplinary methods in the archaeological sciences. Laboratory facilities are especially well equipped to support the study of human skeletal biology, archaeobiological remains (faunal and botanical), environmental studies, and geoarchaeology (particularly studies in human-landscape interactions and the study of site formation processes). Research projects utilizing other archaeological scientific approaches are also eligible for consideration, depending on the strength of the questions asked and the suitability of the plan for access to other equipment or resources not available on site.

Research Associate for 2018-2019

* Current competition begins in fall of 2017 for the 2018-2019 academic year (January 15, 2018, deadline for applications)
* Term variable, up to 9 months
* Eligibility limited to individuals actively enrolled in a graduate program and individuals with a higher-level degree in a relevant discipline
* Stipend: variable up to $7,000

Programmatic Post-Doctoral Fellowship for 2018-2022

* Current competition begins in fall 2017 for the 2018-2021 academic years (January 15, 2018 deadline for applications)
* 3-year term
* Eligibility limited to any archaeological project affiliated with the ASCSA, current and former permit holders. A specific candidate for the fellowship must be named in the application who has received their PhD and has a demonstrable record of research and publication directly relevant to the project.
* Stipend: $35,000 per annum

For more information and instructions on how to apply: http://www.ascsa.edu.gr/index.php/wiener-laboratory/wlfellowships

The American School of Classical Studies at Athens does not discriminate on the basis of

race, age, sex, sexual orientation, color, religion, ethnic origin, or disability when considering admission to any form of membership or application for employment.

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Alicia M. Dissinger, PhD
Programs Administrator
American School of Classical Studies at Athens

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INSTAP STUDY CENTER FOR EAST CRETE PACHEIA AMMOS, CRETE, ANNOUNCING AN EXCITING OPPORTUNITY FOR FUNDING IN 2018-2019

INSTAP STUDY CENTER FOR EAST CRETE Pacheia Ammos, Crete
72200 Greece
+30-28420-93027, www.instapstudycenter.net

ONLINE APPLICATION: Follow link on homepage of www.instapstudycenter.net.

2018-2019 HARRIET BOYD HAWES FELLOWSHIP APPLICATION GUIDELINES
The INSTAP Study Center for East Crete is pleased to announce the availability of one fellowship to be awarded on a competitive basis to an eligible candidate for work to be done at the Study Center in Pacheia Ammos, Crete in 2018–2019. This fellowship aims at the investigation of the role of women or gender studies in Bronze Age Crete. It is intended to highlight spheres and aspects of ancient life that have not yet received sufficient attention in Aegean Bronze Age studies. The fellowship is intended for scholars in the field of the Aegean Bronze Age/Early Iron Age who have completed their PhD Dissertations. The fellowship will be awarded in the amount of $3,000. Applications must be received by e-mail no later than **February 1, 2018.** Please send your application and required information as attachments to elizabethshank@hotmail.com.

In addition to the completed application form, proposals should include a *curriculum vitae* of the applicant, a page summarizing the title and intent of the project, an outline of the intended project, relevant bibliography, copies of appropriate permits, and two letters of support for the project by two colleagues. The fellowship is open to those holding a PhD in Archaeology, Anthropology, Art History, Ancient History, or Classics. The recipient must be prepared to present an overview of his or her work and findings in the KENTRO Newsletter and/or a public lecture at the INSTAP Study Center for East Crete. The research should be carried out on Crete, and the grant includes membership fees to the INSTAP Study Center. Desirable methods of inquiry include:

o Ethnography/experimental archaeology
o Exploration of written archives and collections from various periods
o Library research
o Examination of archaeological materials, including artifacts, bones, and other organic remains

This fellowship is intended to provide supplementary income for researchers who are either exploring new fields of study or finishing extended research. The amount of the award is US $3,000, which can be applied to travel or living expenses, but should not be used as salary or for the purchase of equipment (e.g., cameras or computers). The primary aim of the funding is to stimulate new forms of research, which will broaden the scope of Minoan studies.

Consideration for the fellowship is open to all candidates meeting the stated requirements. Awards are made irrespective of race, gender, religion, national origin, age, disability, marital status, sexual orientation, and actual or perceived medical conditions. It is possible that in the absence of qualified candidates with appropriate projects, a fellowship will not be awarded.

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RADIOCARBON DATING OF LIME MORTARS, PHD FELLOWSHIP/SCHOLARSHIP AT GRADUATE SCHOOL OF SCIENCE AND TECHNOLOGY, AARHUS UNIVERSITY, DENMARK

Applications are invited for one PhD fellowship/scholarship at Graduate School of Science and Technology, Aarhus University, Denmark, within the Physics and Astronomy programme. The position is available from 1 May 2018 or later.

Title:
Radiocarbon dating of lime mortars

Research area and project description:
Candiates are invited to apply for a PhD fellowship focused on improving and developing the method for radiocarbon dating of lime mortars. Radiocarbon of lime mortars have developed over the past 10–15 years and have been successfully applied for radiocarbon dating of e.g. the churches of Åland, Sweden. However, the method have proven to fail or be partly successful in other settings such as Jerash, Jordan. With this project, we wish to develop the method further to include some of the more challenging settings.

The first stage of the proposed PhD project, the successful candidate will apply geochemical and micro morphological methods and PIXE/PIGE to characterize known age mortars in order to modify the CO_2 extraction method to obtain ^{14}C chronologies. Secondly, the improved CO_2 extraction method will be applied to construct improved chronologies of Jerash site in Jordan. Overall the aim will be to find new pathways for improving the accuracy and reproducibility of radiocarbon mortar dating.

This project will be in close collaboration with international radiocarbon mortar specialist in Finland and Switzerland among others.

This PhD fellowship is funded by The Danish National Research Foundation's Centre of Excellence, Centre for Urban Network Evolutions (UrbNet) at School of Culture and Society, Aarhus University. The overall aim of the project is to develop methods for ^{14}C dating of mortars on sites of interest to UrbNet where an absolute chronology is essential to advance our understanding of urban networks.

Qualifications and specific competences:
The ideal candidate will have a MSc within Physics, Chemistry, Geoscience, Archaeological sciences, Geochemistry or related fields, demonstrated analytical skills, a good command of English, excellent interpersonal skills, an open attitude to interdisciplinary research, and the ability to work in international collaborations.

Place of Employment and Place of Work:
The place of employment is Aarhus University, and the place of work is Department of Physics and Astronomy, Munkegade 120, DK-8000 Aarhus C. The project is in close collaboration affiliation with The Danish National Research Foundation's Centre of Excellence, Centre for Urban Network Evolutions (UrbNet) at School of Culture and Society, Aarhus University.

Contacts:
Applicants seeking further information are invited to contact:
Associate professor Jesper Olsen, Department of Physics and Astronomy, jesper.olsen@phys.au.dk or Professor Rubina Raja, School of Culture and Society, rubina.raja@cas.au.dk.

Application procedures

Before you apply

Information and attachments:
Please be aware that you must have all relevant appendices, attachments, addresses for referees, etc. ready when you apply, as the entire application must be uploaded to the system in one go.

Documentation of language skills:
The English language requirement at Graduates School of Science and Technology is comparable to an "English B level" in the Danish upper secondary school ("gymnasium").

English language qualifications comparable to an "English B level" is documented by one of the following tests:

- **TOEFL test**, minimum score: 560 (paper-based test) or 83 (internet-based test)
- **IELTS (academic) test**, minimum average score: 6.5 points
- **Cambridge English Language Assessment:**

Cambridge Certificate of Proficiency (CPE)
Cambridge English: Certificate of Advanced English with grade A,B or C (CAE)
Cambridge English: First Certificate with grade A (FCE)

When to take the test and how to upload the documentation:
The test result must not be more than two years old at the time of application.

The English language test should be taken before applying for admission and uploaded under "language skills documentation" in the online application form.

It is possible to apply for admission before you have taken the test. In this case documentation stating that you have signed up for a test (please state expected submission date) must be uploaded. If the test result is not part of the original application the test result is to be sent to sphd@psys.au.dk no later than one month after the application deadline.

The following applicants are exempted from documenting their English qualifications/taking a test:

- Applicants with citizenship from the following countries: Australia, Canada, Ireland, New Zealand, United Kingdom, United States, or one of the Nordic countries (Denmark, Finland, Iceland, Norway or Sweden).
- Applicants with a Bachelor's or Master's programme completed in Australia, Canada, Ireland, New Zealand, United Kingdom, or United States. In this case, please upload your Bachelor's or Master's diploma under the section "Language skills documentation".
- Applicants with a Bachelor's or Master's programme completed at Aarhus University for which the requirement was English B level at the time of admission. In this case, please upload your Bachelor's or Master's diploma under the section"Language skills documentation".
- Applicants able to document that English was the language of instruction during the whole period of their Bachelor's and/or Master's programme. This must be documented by uploading an official document from the institution stating this under "language skills documentation".

The programme committee may request further information or invite the applicant to attend an interview.

How to apply:

1) Find the application form:

Go to http://talent.au.dk/phd/scienceandtechnology/opencalls/

Choose February 2018 Call with deadline 1 February 2018 at 11.59 PM MET. You will be directed to the call, and must choose the programme 'Physics and Astronomy'

2) Fill in the following information:

- Personal information
- Academic background
- Admission
- Financing (if any)
- Study: In the dropdown menu you must choose the project: "Radiocarbon dating of lime mortars"
- Source (how you found out about the call)

Next to some of the information fields you will find a number. Click on the number to get further directions on how to fill in the information field/what information is needed.

3) Application attachments:

Please be aware that you cannot submit the application if one or several of these documents have not been uploaded.

If you wish to upload more than one document under each section, you must scan/merge all documents into one large PDF file and upload this. Please note that we reserve the right to remove scientific papers, large reports, theses and the like. Instead you can indicate a URL where the information is available.

Please note that all information in the application must be in Danish or English.

As a minimum all applications must include (pdf-files only, max. 20 MB, no zip):

- One reference (template for references)
- Curriculum vitae,
- Motivation (max. 1 page)
- Transcripts and diploma(s)

- Project description (½-4 pages). This document should describe your ideas and research plans for this specific project. If you wish to, you can indicate an URL where further information can be found. Please note that we reserve the right to remove scientific papers, large reports, theses and the like.
- Documentation of language skills if required.

After submission of the application you will receive a confirmation e-mail with an application ID, you should use for reference if needed. The e-mail will also include a link to the application – GSST urges you to check that all mandatory data, marked with an asterisk (*), is registered correctly and all attached files are readable. In case of significant errors, you should reply to the confirmation e-mail with the correct details before the application deadline.

GSST reserves the right to verify the authenticity of your educational diploma and transcripts:

- Request additional information to verify an application.
- Reject the application if it is proven, or if the University has reasonable belief, that the information provided is false or if the applicant refuses to provide the requested information, whether or not an offer has already been made.
- For further information on applying, assessment procedures, etc. please see the GSST application guide here

Please note:

- The programme committee may request further information or invite the applicant to attend an interview.
- The project will only be initiated if final funding (from GSST/the faculty) is secured.

All interested candidates are encouraged to apply, regardless of their personal background.

Please visit the site: http://talent.au.dk/phd/scienceandtechnology/opencalls/calls-on-specific-projects/february-2018/radiocarbon-dating-of-lime-mortars/

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

SUERC AMS BEAMTIME

Dear all,

In anticipation of the arrival of our new third instrument for natural abundance C14 measurement we seek expressions of interest in utilising our existing apparatus. The new PIMS spectrometer is the first of a new type of machine, but we currently operate two well-performing AMS instruments.

Accordingly we offer competitively priced radiocarbon accelerator mass spectrometry of pre-prepared graphite samples supplied in significant quantities (large projects or whole programmes). I expect that this might be of interest to existing specialist sample chemistry laboratories, and I would be glad to discuss the possibilities in detail directly.

Stewart

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Professor Stewart P.H.T. Freeman

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ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

PORTABLE XRF ON PREHISTORIC BRONZE ARTEFACTS: LIMITATIONS AND USE FOR THE DETECTION OF BRONZE AGE METAL WORKSHOPS

Heide Wrobel Nørgaard

Published Online: 2017-07-18 | **DOI:** https://doi.org/10.1515/opar-2017-0006
Open Access
Download PDF

Abstract

Two different scientific analyses-one destructive and one non-destructive-were conducted on two separate groups of bronze ornaments dating from 1500-1100 BC to investigate, amongst other traits, the metal composition of their copper-tin alloys. One group of artefacts was sampled, and polished thin sections were analysed using a scanning electron microscope (SEM). Results from the corrosion crust of copper-tin alloys, and the change measured within the elemental composition from the bulk metal to the surface, greatly influenced the interpretation of the second data set, which was measured using a handheld X-ray fluorescence (XRF) device. The surface of corroded bronze ornaments consists mostly of copper carbonates, oxides, and chlorides. Chemical processes, such as decuprification, change the element composition in such a manner that the original alloy cannot be traced with a non-destructive method. This paper compares the results of both investigations in order to define the possibilities and limits of non-destructive XRF analyses of corroded bronze artefacts.

This article offers supplementary material which is provided at the end of the article.

Keywords: portable XRF-analysis; corroded bronze ornaments; determination of workshops; Nordic Bronze Age

Please visit the site: https://www.degruyter.com/view/j/opar.2017.3.issue-1/opar-2017-0006/opar-2017-0006.xml?format=INT

HAVE YOU GOT THE RIGHT TIME?
BY GREG WOOLF

Richard J. A. Talbert
ROMAN PORTABLE SUNDIALS
The Empire in your hand
264pp. Oxford University Press. $58.
978 0 19 027348 4

Most of the things that impress us about the Romans are on a large scale. The Colosseum, the hundreds of miles of aqueducts that brought water to Rome, or the size of the empire itself, still the largest political entity every created in this part of the world. Even the sheer craziness of getting the legions to build a wall right across Britain, a wall which did nothing to make their job any easier, and would have been hopeless at repelling all but the most quarter-hearted of barbarian raids, but gave the emperor bragging rights over his predecessors. But every so often, we find something Roman that is impressive as well as small – such as portable sundials.

The sundials that are the subject of Richard Talbert's loving study vary in size from large coins to pocket watches. Only sixteen have ever been described – a short and beautifully illustrated catalogue is at the heart of the book – and of those, five are now lost and two in the hands of private collectors. Some are little "pill-boxes", each pierced by a tiny hole to let in a ray of light. Others were flat discs made to be suspended, with a marker in the centre to cast a shadow. A few were made of bone, but most are minute masterpieces of engraved bronze or brass. Not very expensive materials perhaps, but these devices were fiendishly difficult to get right.

The tricky bit comes with portability. Every sundial has to be set just right for the latitude at which it is to be used. Move an ordinary sundial from the equator to the north pole, and degree by degree the position of the shadow will change. The Roman world was entirely contained between 20 and 60 degrees north, but all the same a sundial made to work at Memphis on the Nile would give a false reading in Rome or York. A pocket sundial had to be adjustable. There were different ways of doing this, but all depended on the maker having some idea of the latitude of the major cities or regions of the Roman world.

Talbert is the world expert on ancient geographical knowledge. The great collaborative Barrington Atlas of the Greek and Roman World that he oversaw is a huge volume that plots every place in the ancient world whose name is known. After its publication in 2000 Talbert founded an Ancient World Mapping Center at Chapel Hill that continues to lead the field. He has also written the fullest study to date of the great Peutinger Map, a medieval copy of a Roman map of the world compressed onto a strip 33 cm high and more than 7 metres long. It can now be seen in Vienna, almost the sole representative of the ancient predecessors of the Mappa Mundiin Hereford Cathedral. Now Talbert has devoted just as much care to the minute engraving on these tiny sundials. Some were extraordinarily intricate. The example now in the Science Museum in London – which must have looked a little like a spring balance when originally suspended – has gears and ratchets that allow the movement of the moon, the months and the days of the week all to

be calculated. Its beautiful Greek inscriptions mark the latitudes of twelve places in the Roman East, from the Egyptian Thebaid to Thessaloníki, Rome and Athens. Only the mysterious Antikythera mechanism (often wrongly written up as "the world's first computer") surpasses it in precision engineering. Other sundials are much cruder. Most get the latitudes of at least some of the places marked terribly wrong.

The mathematics and mechanics of the individual sundials have long fascinated aficionados. Talbert is not immune to the lure of their various puzzles. Some place names are obscure, some errors of latitude are very difficult to understand, and most sundials aren't easy to date. The underlying principles behind the choice of locations on them often seems bizarre. How were the sundials related to each other?

There is no sign of mass production. Was it possible then to commission a tailor-made list of places? And who used them, and for what? After all, the Roman world was full of stationary sundials that were larger, accurate and easily consulted. And these miniature versions were not portable in the way wrist watches were. No legionary commandos ever synchonized their sundials before a dawn raid.

Talbert's real interest lies in what these objects tell us about Roman society as a whole, and what he has to say here is new. It is evident that there was background knowledge of latitude well beyond the tiny circle of scientific writers. This is as surprising as the fact that precisionengineered machines were evidently common and quite cheap. It is also clear that at least a few hundred place names – some of cities, some of provinces and regions – were easily recognized from the abbreviated form in which they appear. The users of sundials, in other words, could imagine the Roman world in terms not completely unlike the way we do. Like us too, these Romans seem to have cared about precise timing, even if it was almost never really possible for them to know exactly what time it was. They sliced their day into tiny slithers as we do, and worried about being late. Most intriguingly, like so many of us, some of them were fascinated by gadgets.

A unique example from Philippi in northern Greece was made of three bronze rings, attached so they could fold into the same plane to form a flat object just over 7 cm in diameter. Unfolded, its parts describe a sphere. The centre ring is divided into quadrants set for Alexandria, Rhodes, Rome and Vienne in southern France, each marked in Greek letters with the abbreviated month names of the Julian calendar.

An innermost ring is marked for the hours of the day, and a slit has been cut for the sun's rays to mark an hour. What traveller can we imagine who might want to tell the time in those four places (and no others)? And what practical need was there for such miniaturization, since the traveller was almost certainly accompanied on the road by slaves and other attendants? No pragmatic rationale can be reconstructed. But it is easy to imagine the wonder on the faces of the owner's friends as it was passed around a dinner table and its workings explained to them. A last revelation then, that there were Romans who could be amazed as much at the very small as at the very big, just as we are.

Please visit the site: https://www.the-tls.co.uk/articles/private/have-you-got-the-right-time/

ADVANCED MATERIALS FOR THE CONSERVATION OF STONE

Editors: **Hosseini**, Majid, **Karapanagiotis**, Ioannis

Provides a basis for advanced materials technology assessments applied to stone conservation;Presents a thorough overview of cutting–edge discoveries and detailed information on recent technological developments, the current status, and future outlook;Covers environmental impact, sustainability, social eff ects, and economic benefits;Addresses a wide range of global scientific communities that develop and apply advanced materials for conservation purposes.

This book identifies novel advanced materials that can be utilized as protective agents for the preservation of stone. The innovative solutions to stone conservation presented here result in increased sustainability, reduced environmental impact, and increased social and economic benefits. It provides an overview of recent trends and progress in advanced materials applied to stone protection. It also explores the scientific principles behind these advanced materials and discusses their applications to diff erent types of stone preservation efforts. Essential information as well as knowledge on the availability and applicability of advanced nanostructured materials is also provided, with focus placed on the practical aspects of stone protection. Th e book highlights an interdisciplinary eff ort regarding novel applications of nanostructured materials in the advancement of stone protection. It provides insight towards forthcoming developments in the fi eld. Advanced nanostructured materials are designed and developed with the aim of being chemically, physically, and mechanically compatible with stone. Advanced materials for stone conservation that are characterized by several functional properties are considered in this book. These include the physico-chemical, protective, and morphological properties, eco-toxicity, and mechanisms of degradation. The authors present a thorough overview of cutting–edge discoveries, detailed information on recent technological developments, breakthroughs in novel nanomaterials, utilization strategies for applications in cultural heritage, and the current status and future outlook of the topic to address a wide range of scientific communities.

Please visit the site: http://www.springer.com/us/book/9783319722597

ΕΙΔΗΣΕΙΣ - NEWS RELEASE

SCIENTISTS HAVE FOUND A HIDDEN CHAMBER IN EGYPT'S GREAT PYRAMID OF GIZA, THE FIRST SUCH DISCOVERY IN THE STRUCTURE SINCE THE 19TH CENTURY AND ONE LIKELY TO SPARK A NEW SURGE OF INTEREST IN THE PHARAOHS

In an article published in the journal Nature on Thursday, an international team said the 30-meter (yard) void deep within the pyramid is situated above the structure's Grand Gallery, and has a similar cross-section. The purpose of the chamber is unclear, and it's not yet known whether it was built with a function in mind.

The scientists made the discovery using cosmic-ray imaging, recording the behavior of subatomic particles called muons that penetrate the rock similar to X-rays, only much deeper.

Their paper was peer-reviewed before appearing in Nature, an international, interdisciplinary journal of science.

The pyramid is also known as Khufu's Pyramid for its builder, a 4th Dynasty pharaoh who reigned from 2509 to 2483 B.C. Visitors to the pyramid, on the outskirts of Cairo, can walk, hunched over, up a long tunnel to reach the Grand Gallery. The newly discovered chamber does not appear to be connected to any known internal passages.

Scientists involved in the scanning called the find a "breakthrough"
that highlighted the usefulness of modern particle physics in archaeology.

"This is a premier," said Mehdi Tayoubi, a co-founder of the ScanPyramids project and president of the Heritage Innovation Preservation Institute. "It could be composed of one or several structures... maybe it could be another Grand Gallery. It could be a chamber, it could be a lot of things."

"It was hidden, I think, since the construction of the pyramid," he added.

The pyramids at Giza, the last surviving wonder of the ancient world, have captivated visitors since they were built as royal burial chambers 2,500 years ago. Experts are still divided over how they were constructed, so even relatively minor discoveries generate great interest.

Late last year, for example, thermal scanning identified a major anomaly in the Great Pyramid — three adjacent stones at its base which registered higher temperatures than others, stoking imaginations worldwide.

Speculation that King Tutankhamun's tomb contains additional antechambers stoked interest in recent years, before scans by ground-penetrating radar and other tools came up empty, raising doubts about the claim.

The muon scan is accomplished by planting special plates inside and around the pyramid to collect data on the particles, which rain down from the earth's atmosphere. They pass through empty spaces but can be absorbed or deflected by harder surfaces, allowing scientists to study their trajectories and discern what is stone and what is not. Several plates were used to triangulate the void discovered in the Great Pyramid.

Tayoubi said the team plans to work with others to come up with hypotheses about the area.

"The good news is that the void is there, and it's very big," he said.

Please visit the site:
http://english.ahram.org.eg/NewsContent/9/40/280856/Heritage/Ancient-Egypt/BREAKING-Scientists-discover-hidden-chamber-in-Egy.aspx

INSIDE GIZA'S GREAT PYRAMID, SCIENTISTS DISCOVER A VOID, BY NICHOLAS ST. FLEUR

The Great Pyramid of Giza has towered over Egypt for more than 4,500 years. Built during the reign of Pharaoh Khufu, the monument was a testament to the ruler's architectural prowess and is thought to have been a home for his mummified remains.

For centuries, archaeologists have ventured into the Pyramid of Khufu, as it is also known, and marveled at the King's chamber, the Queen's chamber and the Grand Gallery. Now, using a technique from the field of particle physics, an international team of researchers has harnessed cosmic-ray collisions to peek inside and uncover a hidden "void" within the pyramid's stones that is roughly 100 feet long, similar to the Statue of Liberty from her heel to her head.

"We don't know if it's a chamber, a tunnel, a big gallery or things like that," said Mehdi Tayoubi, co-director of the ScanPyramids project, which published the finding Thursday in the journal Nature.
"We have chosen the word 'void' and nothing else because we don't know what this void is."

Many archaeologists questioned whether the study offered any new information about the ancient Egyptians, and were quick to note that the team had most likely not found a hidden room filled with the pharaoh's riches. They said the so-called void was probably empty space designed by the pyramid's architects to lessen the weight on its chambers and prevent them from collapsing, an example of features that were already documented in the construction of the ancient monuments.

However, the study may suggest that advances in technology can offer a richer understanding of wonders of the ancient world that have long fascinated the human imagination.

Khufu, also known by his Greek name Cheops, is thought to have ruled from 2509 B.C. to 2483 B.C., during Egypt's fourth dynasty. Though he constructed the largest pyramid Egypt has ever seen, the only intact three-dimensional figure of him that archaeologists have found measures a mere three inches tall. Very little is known about him, so his pyramid offers one of the few looks into his life and reign. The site at Giza where his pyramid was built also contains two other major pyramids and the Sphinx.

Since 2015, Dr. Tayoubi and his colleagues, now consisting of three separate teams of physicists and engineers, have investigated the pyramid using a particle physics technique known as muon tomography to see through to its core.

"We tried to do for the pyramid what a doctor can do with X-rays," Dr. Tayoubi said.

Instead of X-rays, the team used muons, the heavy cousins of electrons that form when cosmic rays from outer space collide with particles in Earth's atmosphere. The fallout

from the collisions creates a constant bombardment of harmless particles that can penetrate deep into the planet. As the muons pass through matter they lose energy and decay, so if the team detected a small number of muons, that means they were passing through matter. But if they detected more muons, it suggests the particles were passing through empty space or less dense material.

The technology was previously used by Luis Alvarez, a Nobel Prize-winning physicist, to investigate whether there were hidden chambers in the Pyramid of Khafre in the 1960s. As muon detector resolution has greatly improved over the decades, it has since been used to see the inner structures of volcanoes as well as the irradiated Fukushima nuclear reactor.

In 2016, Dr. Tayoubi's colleagues stood in the Queen's chamber and used muon detectors capable of making improved measurements to study particles as they passed through the pyramid. When they analyzed their data from a region above the Grand Gallery, a long inclined passageway that leads to the King's Chamber, they found something strange: an unexpected excess of muons.

They found a void.

The first measurements were made by researchers from Nagoya University in Japan who were a part of the project. Then two more teams associated with ScanPyramids, one from France and another from Japan, also confirmed the anomaly with muon tomography, even from outside the pyramid. The discovery comes on the footsteps of the team's previous work, which detected a small void behind the north face of the pyramid in 2016.

Christopher Morris, a physicist who conducts research using muon tomography at Los Alamos National Laboratory and was not involved in the study, called the findings "pretty amazing," adding that all the team needed to do was set up their muon detectors and reap the rewards.

"All the other physicists who could have done it, and didn't, are jealous," he said.

Arturo Menchaca-Rocha, a physicist from the National Autonomous University of Mexico who has used muon detection to investigate the Pyramid of the Sun in Mexico, echoed Dr. Morris's sentiments and said the project's physics supported its claims.

But archaeologists were more critical of the work.

Mark Lehner, an Egyptologist from Ancient Egypt Research Associates, said that previous work had shown that the ancient Egyptians most likely constructed gaps in their pyramids and that the voids the team found are nothing special, or new.

"The great pyramid of Khufu is more Swiss cheese than cheddar," he said. He added that the steep incline of the void also casts doubts on whether it was some sort of room. "At that angle, it doesn't make much sense for it to be a chamber that would contain artifacts, burials and objects and that sort of thing."

Zahi Hawass, an Egyptologist, former Egyptian government minister and head of the scientific committee appointed by the Egyptian Ministry of Antiquities to review the work, was more critical of the finding.

"They found nothing," said Dr. Hawass, noting that such construction gaps had been known of for at least two decades. "This paper offers nothing to Egyptology. Zero."

Both Dr. Lehner and Dr. Hawass agreed that the scanning work should continue in hopes that the teams can retrieve higher resolution data about the inner workings of the pyramid, specifically the shape and size of the anomaly.

Hany Helal, who is also a co-director of the ScanPyramids project, responded to the criticism, saying that from an engineering perspective, it would not make sense to have such a big void above the Gallery if its purpose was to relieve pressure.

He said the next steps are to have an international discussion with archaeologists to figure out the structure's purpose. In the future, he added that scientists may use drones to explore the void once they have more information about it.

"We are sure there is a void," he said. "Now let us continue our research."

Please visit the site: https://www.nytimes.com/2017/11/02/science/pyramids-giza-void.html

ANCIENT GREECE: HAUL OF JEWELS AND GOLDEN COINS UNCOVERED FROM 2,000-YEAR-OLD TOMBS, BY CALLUM PATON

Archaeologists in Greece have uncovered rare jewels, coins and other artefacts while excavating tombs near the ruins of the classical city of Corinth dating to between the fourth and first centuries A.D.

The team of experts, working with the Greek Ministry of Culture, made the discoveries in eastern Corinthia, at the site of the ancient village of Tenea, while excavating a burial ground with two distinctive chambers built when Greece was part of the Roman Empire.

The Greek Ministry of Culture said in a statement that the Roman burial monuments appeared to have been built into a preexisting Hellenic substructures from the period between the death of Alexander the Great in 323 B.C. up until the Roman conquest in B.C. 146.

Five of the most well-appointed tombs, the experts said, would have belonged to wealthy inhabitants of Roman Greece. Bodies were found alongside elaborate gilded bronze leaves, a golden ring, precious stones and gold and bronze coins from the surrounding region.

Their bodies were found alongside elaborate gilded bronze leaves, a golden ring, precious stones and gold and bronze coins from the surrounding region. GREEK MINISTRY OF CULTURE

Among the other ritualistic items buried with the dead were perfumes, artefacts made of gold, gold foil and elaborately crafted glassware, as well as items of pottery.

Also within the dig site the archaeologists recovered items from a series of different burial plots. Fourteen graves, organized in circles, as was Roman convention, yielded a number of gold and and silver coins, vases and a series of lamps, the most striking of which bore depictions of the Roman goddess Venus and two cupids.

Of particular interest to the excavation team, led by Elena Korka, were the older Greek parts of the structures. One side of the Roman burial monument was built above an typical rectangular Hellenistic basement made of limestone and then coated in a thick layer of mortar.

In other areas they found evidence of graves from the earlier Greek period, pottery including a figurine in the shape of a dove and other ritual items such as perfume. It also appeared some of the lower vaults in the buildings would have been associated with other Greco-Roman rituals.

The period of Roman rule in Greece began following the destruction of Corinth, when the Roman Empire annexed the Greek heartlands and crushed the Peloponnesians, the Greek peoples living in the southern part of the country.

The Greeks were able to maintain relative autonomy from their Roman rulers during the early period of empire with sophisticated Greek culture, its philosophy and literature having a profound influence on Rome's educated elite.

Please visit the site: http://www.newsweek.com/ancient-greece-haul-jewels-and-golden-coins-uncovered-2000-year-old-tombs-698275

THE HI-TECH ARCHAEOLOGICAL SCIENTISTS, BY DARYL HOLLAND

The lone fedora-clad archaeologist armed only with his trusty whip on a swashbuckling adventure to discover ancient relics from lost civilizations makes for a great movie plotline, but archaeology doesn't really work that way.

In reality, major discoveries are more likely the result of years of painstaking searching, sifting, cataloguing and interpretation by a team of archaeologists, local experts and, increasingly, scientists.

In modern archaeology, evening discussions at field camps are more likely to turn to the latest advances in powder x-ray diffraction or Fourier-transform infrared spectroscopy.

"You could define archaeological science as the application of methods from the physical and biological sciences to archaeological problems and from there to the grand history of humankind on Earth," says Professor Andy Gleadow, leader of the Kimberley Rock Art Dating Project.

Since the 1950s, archaeological science has gradually emerged as a separate but complementary discipline to archaeology, with an ever-expanding range of analytical methods needing advanced specialist skills.

"There are important opportunities for archaeological science in Australia at the moment, where the field is not as highly developed as it is in some other parts of the world, particularly in Europe," says Professor Gleadow.

The field of archaeological science in Australia has received a major boost following donations from the Kimberley Foundation, philanthropist and University of Melbourne Chancellor Allan Myers, and the Mindaroo Foundation, for a Professorial Chair in Archaeological Science at the University of Melbourne.

The Chair will be based in the School of Earth Sciences, where Professor Gleadow leads a team of scientists who are adapting existing geological dating techniques and advanced materials analysis to archaeological studies.

For her PhD, Dr Helen Green used uranium-thorium dating techniques to measure the age of stalagmites in caves to better understand past climates. This dating method establishes the time of origin of a mineral sample by the rate of radioactive decay of uranium to thorium.
Now, as a post-doctoral research fellow, Dr Green has adapted this technique to date the rock art of the Kimberley region, in remote far north-west Australia.

Before she began this project, this kind of dating had never been done on the kinds of rocks found in the Kimberley.

"This technique was tried and tested in calcium carbonate, but in the Kimberley, it's all sandstone," she says.

Dr Green has perfected a new method for dating mineral samples accumulating on sandstone surfaces. With permission from the local Indigenous people, she takes small mineral samples from both the top and from underneath the rock art for dating.

The resulting dates 'bracket' the age of the painting.

"Bracketing gives us maximum and minimum ages, which are only useful if you can do it on a grand scale, if you can get hundreds of them,"
says Professor Gleadow.

"Then you start to get the basis of a statistical relationship."

"And it all depends critically on all the work that's been done previously by archaeologists who have worked out a relative age sequence for the rock art, where the styles of the art change through time, and one style is painted on top of another.

Dr Helen Green in front of Gwion figures on Balanggarra land in the Drysdale River region of the Kimberley. Credit: Traditional Owners and the Balanggarra Aboriginal Corporation

"So, there's that positional relationship that tells you the relative sequence, but it doesn't tell you anything about absolutely how old they are, so our job is try to put an absolute time scale on it."

PhD student Damien Finch is also dating the rock art, but using a completely different kind of sample.

"In the Kimberley there's these little mud wasps," says Mr Finch.

"They build mud nests on the rock walls and these nests contain small amounts of charcoal, which we can date using radiocarbon dating."

Professor Gleadow is keen for scientists expert in dating to be closely involved in every aspect of the research, from locating and sampling suitable materials, through to analysis in the laboratory. He says scientists need to really understand what they are collecting because of the sheer complexity of getting true dates and the many things that can go wrong.

"If you haven't done the hard yards to really understand what that material is, and how it got there, how stable it is and all these other aspects, you are wasting your time.

Mr Finch has found that the charcoal used to date mud wasp nests is often already old before being added to the nest (up to 1000 years old), so any dates from these nests need to be adjusted using advanced statistical techniques to take this into account.

Dr Green says in the past archaeologists had unrealistic expectations of how easily and precisely the scientists can date things, and are surprised when things don't go to plan.

The stump of a mineralised mud wasp nest built on top of a Gwion painting, many thousands of years ago. Credit: Damien Finch

But she says that since she has been working side-by-side with them the mutual understanding has grown.

"They have a much better understanding of the issues we have to overcome," she says.

"And we can see first-hand the value of the archaeologist's expertise in identifying rock art styles and the deep cultural understanding that allows us to develop collaborations with the Traditional Owners and Aboriginal Corporations."

"The two sides coming together is quite a cool thing."

Professor Gleadow says the Kimberley Rock Art Dating project has been tremendously successful in developing new approaches for dating rock art.

"It's an astonishingly difficult thing to do - certainly the most challenging and difficult research I've ever undertaken."

Please visit the site: https://phys.org/news/2017-10-hi-tech-archaeological-scientists.html

FIRST INFERTILITY DIAGNOSIS MADE 4,000 YEARS AGO DISCOVERED IN CUNEIFORM TABLET IN TURKEY

The first diagnosis to determine infertility was made 4,000 years ago, an ancient Assyrian clay tablet discovered by Turkish researchers in central Kayseri province revealed Thursday.

Various researchers from different universities led by Şanlıurfa's Harran University examined a 4,000-year-old Assyrian tablet containing a prenuptial agreement and found out that the first infertility diagnosis was made in central Kayseri province's Kültepe district.

The clay tablet written in cuneiform script discusses infertility and a solution for the issue, which is the inability of a person to reproduce through natural means.

Professor Ahmet Berkız Turp from Harran University's Gynecology and Obstetrics Department told NTV that the clay prenuptial agreements addressed the issue of infertility in Assyrian families.

Accordingly, the wife would allow her husband to hire a hierodule - a female slave brought in to serve as a surrogate - if the couple failed to conceive a baby two years after the date of marriage.

"The female slave would be freed after giving birth to the first male baby and ensuring that the family is not left without a child," Professor Turp said.

The results of the research have been published in the medical journal of Gynecological Endocrinology and the tablet is on display at the Istanbul Archaeology Museum.

Assyria was a complex Mesopotamian civilization dating back to the 25thcentury B.C.

Kültepe was home to an Assyrian settlement of the Old Assyrian Empire from the 21st to 18th centuries B.C.

Over 1,000 cuneiform tablets were discovered at the site in 1925, while modern archaeological work started in 1948.

Please visit the site: https://www.dailysabah.com/history/2017/11/09/first-infertility-diagnosis-made-4000-years-ago-discovered-in-cuneiform-tablet-in-turkey [Go there for pix]

AN AFFAIR OF HERBAL MEDICINE? THE 'SPECIAL' KITCHEN IN THE ROYAL PALACE OF EBLA, BY AGNESE VACCA, LUCA PEYRONEL, AND CLAUDIA WACHTER-SARKADY

In antiquity, like today, humans needed a wide range of medicines, but until recently there has been little direct archaeological evidence for producing medicines. That evidence, however, also suggests that Near Eastern palaces may have been in the pharmaceutical business.

Most of the medical treatments documented in Ancient Near Eastern cuneiform texts dating to the 3rd-1stmillennium BCE consisted of herbal remedies, but correlating ancient names with plant species remains very difficult. Medical texts describe ingredients and recipes to treat specific symptoms and to produce desired effects, such as emetics, purgatives, and expectorants. Plants were cooked, dried or crushed and mixed with carriers such as water, wine, beer, honey or milk —also to make them tastier. Indeed, plants used in medicine were often toxic or unpalatable and were not consumed as food. For several plant species it appears difficult to ascertain whether they were used as pharmacological remedies, psychoactive substances, or both. For some specific diseases (such as impotence) both therapeutic and magical treatments are documented, and in most cases a clear distinction between the two cannot be made.

Ebla and Its Royal Palace

Very few archaeological contexts excavated in the Ancient Near East have revealed clear evidence of medical plants remains and associated processing installations. The oldest is from Ebla, the capital of an important kingdom during the late Early Bronze Age (c. 2450-2300 BCE).

Its political and economic relations with other regional centers of Syria and Mesopotamia (such as Mari, Kish and Nagar), and its administration have been reconstructed thanks to the discovery of thousands of cuneiform documents from the State Archives. The excavations carried out by the Italian Archaeological Expedition, headed since 1964 by Paolo Matthiae of Sapienza University of Rome, revealed a large palatial complex (Royal Palace G), so far excavated over 4.500 square meters.

Palace G, like other Early Bronze Age palaces in Syria and Mesopotamia, had units devoted to different functions, including for storing primary products and preparing food, as well as administrative and residential sectors. In the Royal Palace of Ebla, beside the Administrative Quarter (with the cuneiform archives and the 'treasury'), sectors devoted to primary products were brought to light. Several specialized rooms were equipped with benches, basalt slabs, and installations for pressing olives and milling cereals.

Moreover, hundreds of vessels, including cooking pots, storage jars and tablewares were found in their original position at the time of the final destruction of the palace (around 2300 BCE).

The great quantities of food resources collected by the central administration were processed to prepare meals for the royal family and the royal court, or to be redistributed as food rations and wages for the palace's employees. Cuneiform texts from the royal archives which mention squads of flour female millers (named 'dam kikken') under the control of overseers, allow us to imagine these workspaces occupied by dozens of squatting women grinding cereals.

But a completely different picture emerges from one of the palace's rooms, located in a very peculiar position, at the bottom of the Monumental Stairway in close proximity to the Court of Audience. The room was equipped with at least eight fireplaces, and several cooking pots were found in place over the hearths, and smashed above the floor. Analysis of the jars' contents, and botanical remains scattered all over the room, show that the majority of species processed in the kitchen were wild herbs.

The Special 'Kitchen' of Royal Palace G (room L.2890)

If this room had been a "normal kitchen" we would expect large quantities of food plants, and faunal remains. But only small amounts of food plants (21.6%) and almost no animal bones were collected, whereas a large amount of non-food species (78.4%), such as spurges, was identified in this room.

The discovery of a great quantity of spurges (Euphorbiaceae), together with other wild plant remains such as calendula, chamomile, poppy, cleavers, hawthorn, heliotrope in the 'kitchen" of Royal Palace G at Ebla, presents an exceptional case study.

The discovery of seeds and stems of wild herbs show that various parts of plants were used including flowers, leaves and roots. Dark burnt, solid incrustations, thin in section, and with a melted and glossy appearance (sometimes with bubbles), have been found inside the jars and at the bottom of the hearts. These incrustations are residues from different processes such as resin extraction (Euphorbia, in particular, exudes a milky resinous latex), or boiling plants in water, with the addition of olive oil or honey, in order to prepare medicinal drinks, infusions, or anointments.

Resin extraction could be obtained with a simple melting process: the latex of Euphorbia, which is water-soluble, is heated in water and the insoluble resin melts and rises to the surface to be skimmed off. The rest collects at the bottom of the vessel. After separation the resin hardens when exposed to air. Dried latex (Euphorbium) is still used as a drug in African countries, and extracts of Euphorbiaceae, which have anti-inflammatory, analgesic, antioxidant and antimicrobial properties, are used today in alternative medicine in Europe. Overall, the wild species found in the kitchen grow naturally in semi-arid zones, where important families of medicinal plants are documented.

The quantity of products that could have been processed within the kitchen, using all eight hearths, and pots having a capacity from 40 to 70 liters, is remarkable. The combined presence of wild plants with medicinal or stimulant properties, the fire

installations, the high number of vessels, and the very location of the kitchen, underlines the uniqueness of this room.

Processing and Consuming Plants: Medicinal or Other Uses?

Unfortunately we do not have clear references to the use of stimulants in texts from Ebla, although some ceremonies imply ritual consumption of foods and beverages during convivial occasions. The proximity of the kitchen to the official sector of the palace suggests that it was used to prepare beverages for special occasions in relation with reception and ceremonial activities. We have also suggested that some plants attested in the 'kitchen' have psychoactive properties and were used for the extraction of resins and preparation of beverages.

On the other hand, the processing of vegetal substances to prepare medical remedies is equally plausible, and well attested in ancient pharmaceutical texts. An extraordinary tablet from Palace G quotes several medicinal plants used for gastrointestinal, dermatological, and gall bladder diseases, and notes their exact doses and the therapy. Although the correlation of plant species and ancient plant names remains a difficult task, it has been recently suggested that the eblaic term gišne-gi-ba-tum may be interpreted as euphorbia. The term recurs in a cuneiform document mentioning the purchase of the medicinal plant by a man from the Royal entourage in exchange for a large amount of wool. Besides Euphorbiaceae some 34 other different taxa with medicinal properties were found, though in lower numbers.

The beverages produced in "kitchen" L.2890 may have been used as pharmacological remedies for members of the royal court.

In addition to difficulty in ascertaining whether the beverages produced in the kitchen were used as pharmacological remedies or stimulants, there was no clear separation between medical and magical spheres in the Ancient Near East. Medical texts can prescribe both medical (asûtu) and magical treatments (āšipūtu), fulfilled by physicians (asum) and exorcists (masmassum or wāšipum). It is nevertheless interesting to speculate about the role of the palace, which was probably in the business of purchase and processing large quantities of herbs (a sort of 'big pharma'?), expanding our notion of 3rd millennium BCE institutions.

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Please visit the site: http://asorblog.org/2017/11/07/affair-herbal-medicine-special-kitchen-royal-palace-ebla/

ARCHAEOLOGISTS UNCOVER RARE 2,000-YEAR-OLD SUNDIAL DURING ROMAN THEATRE EXCAVATION NOVEMBER 8, 2017

A 2,000-year-old intact and inscribed sundial – one of only a handful known to have survived – has been recovered during the excavation of a roofed theatre in the Roman town of Interamna Lirenas, near Monte Cassino, in Italy.

Not only has the sundial survived largely undamaged for more than two millennia, but the presence of two Latin texts means researchers from the University of Cambridge have been able to glean precise information about the man who commissioned it.

The sundial was found lying face down by students of the Faculty of Classics as they were excavating the front of one of the theatre's entrances along a secondary street. It was probably left behind at a time when the theatre and town was being scavenged for building materials during the Medieval to post-Medieval period. In all likelihood it did not belong to the theatre, but was removed from a prominent spot, possibly on top of a pillar in the nearby forum.

"Less than a hundred examples of this specific type of sundial have survived and of those, only a handful bear any kind of inscription at all – so this really is a special find," said Dr Alessandro Launaro, a lecturer at the Faculty of Classics at Cambridge and a Fellow of Gonville & Caius College.

"Not only have we been able to identify the individual who commissioned the sundial, we have also been able to determine the specific public office he held in relation to the likely date of the inscription."

The base prominently features the name of M(arcus) NOVIUS M(arci)
F(ilius) TUBULA [Marcus Novius Tubula, son of Marcus], whilst the engraving on the curved rim of the dial surface records that he held the office of TR(ibunus) PL(ebis) [Plebeian Tribune] and paid for the sundial D(e) S(ua) PEC(unia) (with his own money).

The nomen Novius was quite common in Central Italy. On the other hand, the cognomen Tubula (literally 'small trumpet') is only attested at Interamna Lirenas.

But even more striking is the specific public office Tubula held in relation to the likely date of the inscription. Various considerations about the name of the individual and the lettering style comfortably place the sundial's inscription at a time (mid 1st c. BC onwards) by which the inhabitants of Interamna had already been granted full Roman citizenship.

"That being the case, Marcus Novius Tubula, hailing from Interamna Lirenas, would be a hitherto unknown Plebeian Tribune of Rome," added Launaro. "The sundial would have represented his way of celebrating his election in his own hometown."

Carved out from a limestone block (54 x 35 x 25 cm), the sundial features a concave face, engraved with 11 hour lines (demarcating the twelve horae of daylight) intersecting three day curves (giving an indication of the season with respect to the time of the winter solstice, equinox and summer solstice). Although the iron gnomon (the needle casting the shadow) is essentially lost, part of it is still preserved under the surviving lead fixing. This type of 'spherical'
sundial was relatively common in the Roman period and was known as hemicyclium.

"Even though the recent archaeological fieldwork has profoundly affected our understanding of Interamna Lirenas, dispelling long-held views about its precocious decline and considerable marginality, this was not a town of remarkable prestige or notable influence," added Launaro. "It remained an average, middle-sized settlement, and this is exactly what makes it a potentially very informative case-study about conditions in the majority of Roman cities in Italy at the time."

"In this sense, the discovery of the inscribed sundial not only casts new light on the place Interamna Lirenas occupied within a broader network of political relationships across Roman Italy, but it is also a more general indicator of the level of involvement in Rome's own affairs that individuals hailing from this and other relatively secondary communities could aspire to."

The ongoing archaeological project at Interamna Lirenas continues to add new evidence about important aspects of the Roman civilization, stressing the high levels of connectivity and integration (political, social, economic and cultural) which it featured.

Please visit the site: https://phys.org/news/2017-11-archaeologists-uncover-rare-year-old-sundial.html [Go there for pix]

GERMAN, EGYPTIAN ARCHAEOLOGISTS DISCOVER ANCIENT GYMNASIUM

A German-Egyptian team of archaeologists has discovered the remains of an ancient gymnasium which dates back around 2,300 years.

The gymnasium, from the Hellenistic period (323-31 BC), was found in Fayoum province, around 100 kilometers south of Cairo.

The gymnasium served as an area for wealthy, Greek-speaking people to practice sports, learn to read and write, and hold philosophical discussions, Ayman Ashmawi, Head of the Ancient Egyptian Antiquities Department at Egypt's Ministry of Antiquities, said Monday.

The newly-discovered gymnasium includes a large hall for meetings, a dining hall, a courtyard as well as a 200-meter-long racetrack.

"The gymnasium of Watfa clearly shows the impact of Greek life in Egypt, not only in Alexandria, but also in the countryside," the head of the mission, Cornelia Roemer, said.

It was found in the area of Watfa, the site of the ancient village of Philoteris, founded by king Ptolemy II in the third century BC, according to the ministry.

The mission started excavations in Watfa in 2010.

The Hellenistic period began around 332 BC with Alexander the Great's conquest of Egypt.

Please visit the site: https://www.dailysabah.com/history/2017/11/06/german-egyptian-archaeologists-discover-ancient-gymnasium

A GRECIAN ARTIFACT EVOKES TALES FROM THE 'ILIAD' AND 'ODYSSEY', BY NICHOLAS WADE

Two years ago, archaeologists excavating an ancient grave at Pylos in southwestern Greece pulled out a grime-encrusted object, less than an inch and half long, that looked like some kind of large bead. They put it aside to focus on more prominent items, like gold rings, that also were packed into the rich grave.

But later, as a conservator removed the lime accretions on the bead's face, it turned out to be something quite different: a seal stone, a gemstone engraved with a design that can be stamped on clay or wax.

The seal stone's image, a striking depiction of one warrior in battle with two others, is carved in remarkably fine detail, with some features that are barely visible to the naked eye. The image is easier to appreciate in a large-scale drawing of the original.

"The detail is astonishing, especially given the size. Aesthetically, it's a masterpiece of miniature art," said John Bennet, director of the British School at Athens, an archaeological institute.

"The stunning combat scene on the seal stone, one of the greatest masterpieces of Aegean art, bears comparison with some of the drawings in the Michelangelo show now at the Metropolitan Museum of Art," said Malcolm H. Wiener, an expert on Aegean prehistory and a trustee emeritus of the Met.

The seal stone comes from an untouched shaft grave near the ancient palace of Pylos. The grave was discovered in May 2015 by Jack L. Davis and Sharon R. Stocker, archaeologists at the University of Cincinnati who had been digging at Pylos for more than 25 years.

"It was after cleaning, during the process of drawing and photography, that our excitement slowly rose as we gradually came to realize that we had unearthed a masterpiece," they wrote in the journal Hesperia.

The seal stone presents two mysteries. One is how and why it was engraved in such detail. The other is whether its battle scene, strongly evocative of those in Homer's "Iliad" and "Odyssey," depicts an event that contributed to the oral tradition behind the works of Homer.

The seal stone's owner, known as the Griffin Warrior after the mythical animal depicted in his grave, was buried around 1450 B.C. He lived at a critical period when the Minoan civilization of Crete was being transferred to cities of the Greek mainland.

Local chieftains, as the Griffin Warrior may have been, used precious items from Crete to advertise their membership in the Greek-speaking elite of the incipient Mycenaean

civilization, the first on mainland Europe. Their descendants, a century or so later, built the great palaces at Pylos, Mycenae and Tiryns, places mentioned by Homer.

Dr. Davis and Dr. Stocker believe that the seal stone, like other objects in the Griffin Warrior's grave, was made on Crete. Work of such quality was not being produced anywhere on the Greek mainland at the time. The detail is so fine that it seems the engraver would have needed a magnifying glass, as would admirers of his work.

Yet no magnifying implements have been found on Crete from this era.
Perhaps the engraver was nearsighted, the two archaeologists suggest.

Fritz Blakolmer, an expert on Aegean art at the University of Vienna, argues that the seal stone is a miniature copy of a much larger original, probably a stucco-embellished wall painting like those found at the Palace of Knossos on Crete. He said the seal must have been engraved by someone with a magnifying glass, even though none has been found, and dismissed the possibility that people of that era had sharper eyesight than today.

The seal, carved on a hard stone known as agate, shows a victorious hero slaying an adversary while a third warrior lies dead in the foreground. The seal stone is mounted so that it can worn on the wrist, and indeed the hero is wearing just such an item, as if it were a wristwatch.

The two defeated warriors seem to belong to the same group, because both are wearing patterned kilts whereas the hero sports a codpiece.
The scene evidently represents some event that would have been familiar to the Minoans who made the seal stone and to the Griffin Warrior's community.

The seal stone's possible relevance to the Homeric epics is intriguing but elusive. Early archaeologists, such as Heinrich Schliemann, who first excavated Troy and Mycenae, believed the "Iliad" recounted historical events and were quick to see proof of this in the artifacts they found.

Later archaeologists were more doubtful, but allowed that the destruction of Troy in 1200 B.C. could have been remembered in oral poetry for 500 years until the Homeric poems were first written down, around 700 B.C.

The Griffin Warrior was buried around 1450 B.C., distancing him even further from the first written version of Homer. Still, there is some evidence that the oral tradition behind the Homeric epics traces as far back as Linear B, the first Greek writing system.

Linear B was adapted by the Mycenaean Greeks from Linear A, used by the Minoans. The oldest known Linear B inscriptions date to 1450 B.C., and the script disappeared after the collapse of Mycenaean civilization around 1200 B.C.

Some of the scansion problems in the Homeric poems "can be resolved if you restore older forms of Greek which are consistent with the dialect recorded in Linear B documents," said Dr. Bennet of the British School at Athens.

So the oral tradition that led to the Homeric epics perhaps stretched over seven centuries.

"We're not saying this is a representation from Homer," Dr. Stocker said of the tableau on the seal stone, while admitting it would be "fun to believe" the hero is Achilles. Rather, the image "is part of a cycle of stories familiar to both Mycenaeans and Minoans."

Dr. Blakolmer, too, finds it tempting to see the figures on the seal as Homeric heroes, like Hector or Nestor, but in his view the temptation must be resisted.

"Fifty years ago, you would find nice attributions to Homeric heroes, but today's academics are very careful in their Homeric attributions,"
he said. "We have to make our own mistakes, not theirs."

Please visit the site: https://www.nytimes.com/2017/11/06/science/greece-griffin-warrior-archaeology-homer.html [Go there for pix]

UNDERWATER SEARCH OFF NAXOS ISLAND COAST YIELDS RICH FINDS

Underwater search off the Greek island of Naxos island has yielded impressive finds of Classical, Roman and Byzantine eras such as stone anchors, late-class amphora, utilitarian vessels, clay pipelines and 15 lithosphere tracks.

Greece's Culture Ministry announced that underwater research along the southern coast of Naxos has been carried out for the second consecutive year by the Ephorate of Old Antiquities in collaboration with the Norwegian Institute of Athens in the framework of a three-year co-operative program. Research is of particular interest since, for the first time, the underwater area of southern Naxos, from Alyko to Panormo, is systematically investigated. It is an isolated area ideal for port exploration, which remains largely unscathed by modern interventions.

The main objective of the program is the recording and mapping of anchoring sites during ancient and Byzantine times. This year's survey ran from 18 to 29 September 2017, and based on the results of the previous survey period (2016), it focused on places of increased interest.

· From the bay of Ag. Sozzontos, NA of the Monastery of Akrotiri, 5 stone anchors and diagnostic samples of ceramics, such as a late-class amphora, utilitarian vessels of classical era, an integral part of a post-Roman / Byzantine clay pipeline, etc., are believed to indicate that the natural harbor was used by archaic to the Byzantine period as anchorage. Iron anchors and anchor fittings (strings) were also found in the same bay.
· Batteries and scraps of ceramics found in Andrios bay, testifying to activity from Roman and Late Roman times.
· In Panormos bay there are 15 lithosphere tracks demonstrating shiploads in the area. The finds of pottery suggest the use of the site mainly during the Roman and Late Roman periods.
· A new location with a rich pottery concentration was found in Turkomspilia west of Akrotiri, Panormos. The objects that were removed (mainly amphoras) date from the 1st century. B.C. until late-Roman and Byzantine times.

The research program will give new insights into how the remote areas without obvious coastal facilities were linked to the sea and, by extension, to the Mediterranean world. It can give new information about unknown seaside locations, used as links between the inland and sea settlements. The study will reveal whether these natural harbors were only used by specific residential centers at particular times or if they were unaffected by habitat changes in inland settlements.

The survey was conducted under the direction of the Head of Ephorate of Underwater Antiquities Dr. Angeliki Simosi, while scientifically responsible and conducting in the field was the diving architect engineer Aikaterini Tagginidou. On the Norwegian side the director of the research was the archaeologist dr. Sven Ahrens, Curator of the Oslo Maritime Museum. Special thanks are due to Messrs. Manolis and Yannis Bardani, for the help and suggestions they offered during the investigation.

Please visit the site: http://www.tornosnews.gr/en/greek-news/culture/27964-underwater-search-off-naxos-island-coast-yields-rich-finds.html

INK FROM ANCIENT EGYPTIAN PAPYRI CONTAINS COPPER

Until recently, it was assumed that the ink used for writing was primarily carbon-based at least until the fourth and fifth centuries AD. But in a new University of Copenhagen study, analyses of 2,000-year-old papyri fragments with X-ray microscopy show that black ink used by Egyptian scribes also contained copper -- an element previously not identified in ancient ink.

In a study published today in Scientific Reports, a cross-disciplinary team of researchers show that Egyptians used carbon inks that contained copper, which has not been identified in ancient ink before.
Although the analysed papyri fragments were written over a period of 300 years and from different geographical regions, the results did not vary significantly:

The papyri fragments were investigated with advanced synchrotron radiation based X-ray microscopy equipment at the European Synchrotron Radiation Facility in Grenoble as part of the cross-disciplinary CoNext project, and the particles found in the inks indicate that they were by-products of the extraction of copper from sulphurous ores.

"The composition of the copper-containing carbon inks showed no significant differences that could be related to time periods or geographical locations, which suggests that the ancient Egyptians used the same technology for ink production throughout Egypt from roughly 200 BC to 100 AD," says Egyptologist and first author of the study Thomas Christiansen from the University of Copenhagen.

No unique ink signature
The studied papyri fragments all form part of larger manuscripts belonging to the Papyrus Carlsberg Collection at the University of Copenhagen, more specifically from two primary sources: the private papers of an Egyptian soldier named Horus, who was stationed at a military camp in Pathyris, and from the Tebtunis temple library, which is the only surviving large-scale institutional library from ancient Egypt.

"None of the four inks studied here was completely identical, and there can even be variations within a single papyrus fragment, suggesting that the composition of ink produced at the same location could vary a great deal. This makes it impossible to produce maps of ink signatures that otherwise could have been used to date and place papyri fragments of uncertain provenance," explains Thomas Christiansen but adds:

"However, as many papyri have been handed down to us as fragments, the observation that ink used on individual manuscripts can differ from other manuscripts from the same source is good news insofar as it might facilitate the identification of fragments belonging to specific manuscripts or sections thereof."

According to the researchers, their results will also be useful for conservation purposes as detailed knowledge of the material's composition could help museums and collections make the right decisions regarding conservation and storage of papyri, thus ensuring their preservation and longevity.

Journal Reference:
Thomas Christiansen, Marine Cotte, René Loredo-Portales, Poul Erik Lindelof, Kell Mortensen, Kim Ryholt, Sine Larsen. The nature of ancient Egyptian copper-containing carbon inks is revealed by synchrotron radiation based X-ray microscopy. Scientific Reports, 2017; 7 (1) DOI: 10.1038/s41598-017-15652-7

Please visit the site:
https://www.sciencedaily.com/releases/2017/11/171110113931.htm

MINISTRY ANNOUNCES NEW PYRAMID INVESTIGATION

An international seminar about the recently discovered gap in the Great Pyramid of Giza will be held in the upcoming period, according to Minister of Antiquities Khaled Anani.

In a statement on Sunday Anani said many archaeologists and Egyptologists will review different explanations for the newly-discovered gap.

Discovered by the international Pyramid's Scan project, the pyramid's gap was found by a team consisting of a number of archaeologists from the U.S., Germany and the Czech Republic as well as Egyptian experts.

The prominent Egyptian archaeologist Zahi Hawas is leading the committee to commence its long-term experiments in the pyramids.

Recently, several archaeological discoveries have been unearthed in Egypt including biggest cemetery for pets in Berenike on the Red Sea coast, a 4000 year old obelisk and a wooden head artifact from the sixth dynasty in Saqqara.

Please visit the site: http://www.egypttoday.com/Article/4/31102/Ministry-announces-new-pyramid-investigation

WERE THERE CAMELS IN ROMAN BRITAIN? NEW EVIDENCE SUGGESTS CAMELS WERE COMMON ACROSS THE EMPIRE, BY SARAH BOND

Were there camels in Roman Britain? Archaeological evidence indicates that camels were used across the Roman empire well into the early medieval period. As historian Caitlin Green suggests, this includes the island province of Britannia.

In Roman antiquity, the camelus (from the Greek word κάμηλος) could come with one hump or two. The single humped camel is commonly called a dromedary. The dromedary was usually from the Arabian Peninsula and the African steppe regions. The two-humped camel was the Bactrian camel (Camelus bactrianus), which generally hailed from the colder desert regions of Asia. There is strong evidence to support the hybridization of these two types as early as the first millennium BCE, which produced a sturdier one-humped animal that could carry about 100 kg more per day.

Camels were commonly known to be used in North Africa, Egypt, and many parts of the ancient Near East. They were highly integral to the incense trade in particular. The elder Pliny (NH 12.32) noted that frankincense had to go through Sabota—Shabwa, capital city of the South Arabian kingdom called Ḥaḍramawt—on camels, and pass through a single gate. Bactrians could carry 220-270 kg between 30-40 km a day, though the ancient historian Diodorus Siculus (2.54.6) suggests over 400 kg. These Bactrian camels were particularly good for carrying freight along the Silk Road in caravans from China in the winter, for instance, but did not do well in heat. They gave hair and milk to traders in addition to their caravan services, but faunal remains would suggest they were not usually eaten along the Silk Road.

From the Hellenistic to the Roman period, dromedaries were used to carry not only freight, but also mail along roads often protected by a police force; this was a camel mail service model inspired by the earlier Persian Empire. A number of overland trade routes stemming from the Red Sea ports used these pack animals to transport freight to the East, in order to connect to the Nile.

Writing in the Augustan era, the geographer Strabo noted that it was the king Ptolemy Philadelphus who had opened up a route to Berenice, so that traders and camels could travel along it. This was done because the Red Sea was itself often unpredictable and difficult to navigate. Berenice and Myos Hormos were the most important of the Red Sea ports, and merchants often used camels to travel to and from Coptos. Thus camels were a pivotal transport link between the Nile region and the Red Sea. Remains of an enclosure near the port at Myos Hormos indicate camels may have been kept there before embarking on the journey to Coptos. Yet osteological evidence for camels within the empire has now expanded our view of these animals to include an area far beyond just the Red Sea region.

Sites with Roman-era camel remains in Europe. Image: C. R. Green, based on a map of the Roman Empire in the early second century AD by Tataryn/Wikimedia Commons,

with the empire depicted in red and its clients during the reign of Trajan in pink; click here for a larger version of this image. The distribution of finds of camel remains in Europe is based on Pigière & Henrotay 2012, Tomczyk 2016, Bartosiewicz & Dirjec 2001, Daróczi-Szabó et al 2014, Albarella et al 1993, Maenchen-Helfen 1973, Moreno-García et al 2007, Vuković-Bogdanović & Blažić 2014, and Vuković & Bogdanović 2013.

In a new blog post by Dr. Caitlin Green, the historian explores the prevalence of camels across the Roman Mediterranean, based on a number of camel remains excavated in areas such as Spain, Italy, France, Germany, Austria, Hungary, Slovenia and the Balkans. As she notes, the remains are dated to between the first and fifth centuries CE, with many coming from the third century or later. Moreover, Dr. Green remarks on the variant use of different types of camels across the
empire: "Recent surveys by both Pigière & Henrotay and Tomczyk indicate that, where identification is possible, the evidence points to dromedaries or Arabian camels being dominant in the western half of Roman Europe whilst Bactrian camels were mainly found in the east, although the split was not absolute—for example, a near-complete skeleton of a Bactrian camel is known from a Roman urban context at Saintes, France, and dromedary remains have been recovered from Kompolt-Kistér, Hungary."

These camels were often used for transport and even for military service, but as Dr. Green points to, could also be used for food and for shows within the amphitheater. Camel teeth found at Greenwich Park, near the ancient city of Londinium (now London), likely come from a temple complex that sat along a busy Roman road. This may suggest some association between camels and higher-status sites in the West. In terms of cost, camels are listed in the Price Edict of Diocletian. This early fourth century price control law provides insight into the argument between using camels versus a wagon. Camels were about 20% cheaper in many areas, but could only carry around around 200 kg. Comparatively, wagons in the later empire could carry over twice as much, 392 kg.

Considering the spotty yet telling osteological remains of camels found across the Roman empire and in Britain, Green concludes the following : "All told, the finds from Greenwich thus seem to fit into the general pattern of Roman-era finds of camel remains across Europe, and there consequently seems little reason not to interpret them in a similar manner, that is to say as evidence of the presence and use of Roman camels, probably primarily as pack animals/beasts of burden.
Certainly, if the Romans were willing to transport elephants across the Channel, as they may well have done, then there seems little reason to think that they wouldn't have done the same with camels, particularly given that camels were apparently being fairly widely employed elsewhere in north-western Europe then."

Clearly, our long-held belief that camels were an animal isolated to use in Egypt, Arabia and other parts of the Near East during the Roman period deserves a dromed-ic revision.

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Please visit the site: https://www.forbes.com/sites/drsarahbond/2017/11/17/were-there-camels-in-roman-britain-new-evidence-suggests-camels-were-common-across-the-empire/

NEW TREASURES FROM TUTANKHAMUN'S TOMB

As part of a German-Egyptian project, archaeologists from Tübingen for the first time examine embossed gold applications from the sensational find of 1922. The motifs indicate surprising links between the Levant and the Egypt of the pharaohs.

Researchers from Tübingen working on a German-Egyptian project have examined embossed gold applications from the treasure of the tomb of the pharaoh Tutankhamun for the first time. The objects come from the famed find made by English archaeologist Howard Carter in 1922. Until now, they had been held in storage at the Egyptian Museum Cairo. They can be seen at a special exhibition at the museum which began on Wednesday. Conservators and archaeologists of the Institute of Ancient Near Eastern Studies (IANES, Professor Peter Pfälzner), the German Archaeological Institute, Cairo, (DAI, Professor Stephan Seidlmayer), and the Römisch-Germanischen Zentralmuseums Mainz (RGZM, Professor Falko Daim), as well as the Egyptian Museum have spent four years (2013-2017) analysing the find. The German Foreign Office and the German Research Foundation (DFG) funded the work.

Through painstaking hours in the lab, the partners restored the objects at the Egyptian Museum. They also made drawings of the items and did comprehensive research on them. A team of conservators, Egyptologists and specialists in Near Eastern archaeology found the embossed gold applications in the same crate they were placed in by Howard Carter's team immediately after their discovery. At the time, the artefacts were photographed and packed, unrestored, and were never again removed until this project.

During years of detail work, conservators Christian Eckmann and Katja Broschat of the Römisch-Germanischen Zentralmuseum Mainz reassembled the fragments to produce 100 nearly complete embossed gold applications. They suspect the items are decorative fittings for bow cases, quivers and bridles. IANES archaeologists from Tübingen examined the images on the embossed gold applications and categorized them from an art-historical perspective. In her dissertation, doctoral candidate Julia Bertsch succeeded in distinguishing the Egyptian motifs on the embossed gold applications from those that could be ascribed to an "international", Middle Eastern canon of motifs.

Among these are images of fighting animals and goats at the tree of life that are foreign to Egyptian art and must have come to Egypt from the Levant. "Presumably these motifs, which were once developed in Mesopotamia, made their way to the Mediterranean region and Egypt via Syria," explains Peter Pfälzner. "This again shows the great role that ancient Syria played in the dissemination of culture during the Bronze Age."

Interestingly, he adds, similar embossed gold applications with thematically comparable images were found in a tomb in the Syrian Royal city of Qatna. There, the team of archaeologists from Tübingen led by Pfälzner, discovered a pristine king's grave in 2002. It dates back to the time of around 1340 B.C., so it is just a bit older than Tutankhamun's tomb in Egypt. The archaeologist says, "This remarkable aspect provided the impetus for our project on the Egyptian finds."

Now", says Pfälzner, "we need to solve the riddle of how the foreign motifs on the embossed gold applications came to be adopted in Egypt".
The professor says that here, chemical analyses have been illuminating. "The results showed that the embossed gold applications with Egyptian motifs and the others with foreign motifs were made of gold of differing compositions," he says. "That does not necessarily mean the pieces were imported. It may be that various local workshops were responsible for producing objects in various styles – and that one used Near Eastern models."

After the current initial exhibition of these objects in Cairo, they will be on display in future in the new Grand Egyptian Museum close to the pyramids at Gizeh. Now, almost a century after they were discovered, and thanks to the work of archaeologists from Tübingen and Egyptologists and conservators from Mainz and Cairo, the scientific analysis of these artefacts from one of Egypt's most sensational archaeological finds has been completed.

Please visit the site: https://www.uni-tuebingen.de/en/university/news-and-publications/press-releases/press-releases/article/neue-schaetze-aus-tutanchamuns-grab.html

TRACING SOCIAL UNREST IN ANCIENT EGYPT TO A VOLCANIC ERUPTION IN ALASKA, BY ELIZABETH JENKINS

Extreme weather has caused chaos recently in places like Puerto Rico and Texas. But to better understand how humans react to these types of events, one historian is looking at the distant past.

Joseph Manning says if you want to study past climate events, ancient Egypt is a good place to start.

The Egyptians kept detailed records. There was everyday bookkeeping on crops, land leases, letters and legal documents, usually written on papyrus.

And Manning says a lot of that has survived.
"Well, ironically because of the dryness of Egypt but also the fondness for mummification, which is interesting," Manning said. "So a lot of documents get recycled as mummy wrappings or mummy stuffing sacred animals and human."

As odd as that may seem, some of these old records were found in the body cavities of mummies.

But when you look at the documents as a whole, Manning says a story starts to emerge and it's one that includes Alaska.

As a history professor at Yale University, Manning studies the Ptolemaic Period. You probably know it as a time when Cleopatra reigned as queen. But to historians, it's a period marked by social unrest and revolts.

That's been linked, in part, to changes in the Nile River. The river didn't flood for two to three years, which meant crops didn't get vital nutrients and irrigation.
"People recall a time in the past when there was widespread famine, and they worried that might happen again," Manning said.

But Manning says an important part of the story was missing — what caused the Nile to stop flooding every year?

So Manning looked for scientists to compare notes. He remembers a colleague showing him a newly published paper on volcanic eruptions.

"I told him the sort of dates I was interested in and they kind of lined up in a spooky sort of way, I would say," Manning said. "And then we got to work."

Beyond the historical documents, like the mummy wrappings and exact measurements of the Nile, Manning teamed up with scientists to examine what he calls "natural archives." That is, layers of ice thousands of years of old.

Below the surface of the ice is a record of major climatic events.
Scientists can pull up core samples and test it for particulates that may have been deposited from a distant volcano.

And Manning was able to use that data, comparing volcanic activity with the timeline.
"You can tell specific eruptions, you can tell approximately where the eruption is located, and you can tell the size of the eruption which also matters," Manning said.

What they found was volcanoes in Iceland, Alaska and possibly Russia were erupting around the same time the Nile River was thrown out of whack.

Manning says large volcanic eruptions can cause cooling and drought.

In the case of the Nile River, the eruption may have caused less rain to fall in Ethiopia so the Nile didn't flood. That, in turn, set off a chain of tumultuous events, that would have been impossible for ancient Egyptians to comprehend.
"Egyptians have no idea there's a volcano in Alaska," Manning said.

Manning says scientists have posed the volcano theory before. But this kind of approach is a new way of understanding how history and climate are connected.
"For the first time you can see a dynamic society," Manning said.
"It's like pulling a curtain back and actually seeing a society moving around as opposed to a static picture of an ancient society."

Manning thinks today, as we see weather shifts caused by warming and human activity, we can learn something from the past.

The ancient Egyptians can help us understand how environmental change influences behavior and potentially leads to political unrest or war.
He says there are skeptics to this approach.

Some other historians have pushed back, saying the research is short sighted.
"Actually I've seen some people say we're part of a fad," Manning said. "Climate change is such a fad these days that will pass."

But Manning doesn't think so. Unlike ancient times, he says we have some control over how things play out. We can reduce carbon emissions and imagine solutions.

Manning wonders what the Egyptians would have done with the same knowledge.

Please visit the site: https://www.alaskapublic.org/2017/11/15/tracing-social-unrest-in-ancient-egypt-to-a-volcanic-eruption-in-alaska/

MUMMY DISCOVERED AT FAYOUM'S DEIR AL-BANAT NEVINE, BY EL-AREF

During excavation work carried out at the Deir Al-Banat (Al-Banat Monastery) archaeological site in Fayoum, an Egyptian-Russian mission from the Russian Institute for Oriental Studies discovered a wooden Graeco-Roman sarcophagus with a mummy inside.

Mostafa Waziri, the secretary-general of the Supreme Council of Antiquities, said that the sarcophagus is in poor condition, with cracks all over its lid and base. The mummy, however, is well-preserved.

He explains that the mummy is wrapped in linen and has a blue and gold cartonnage mask. The mask is decorated with scenes depicting the sky deity Kheibir, while the mummy's chest is decorated with the face of the goddess Isis. The legs have an image of a white sabot.

The sarcophagus

Mohamed Abdel-Latif, head of the antiquities ministry's Coptic and Islamic Antiquities Department, said that the sarcophagus and the mummy underwent conservation work at the site before they were transferred to Fayoum for restoration.

Abdel-Latif said that Deir Al-Banat is known for its Islamic and Coptic antiquities, with its Graeco-Roman necropolis and early Coptic churches and cemeteries.

Please visit the site: http://english.ahram.org.eg/News/281484.aspx

EVIDENCE OF WORLD'S EARLIEST WINEMAKING UNCOVERED BY ARCHAEOLOGISTS

Humans made grape wine hundreds of years earlier than previously believed, according to analysis of clay pottery dating back to 6,000 BC

A neolithic jar – possibly a qvevri, used for fermenting wine – from the site of Khramis Didi Gora, on display at the Georgian National Museum. Photograph: Judyta Olszewski/PA Ashifa Kassam and Nicola Davis

A series of excavations in Georgia has uncovered evidence of the world's earliest winemaking, in the form of telltale traces within clay pottery dating back to 6,000BC – suggesting that the practice of making grape wine began hundreds of years earlier than previously believed.

While there are thousands of cultivars of wine around the world, almost all derive from just one species of grape, with the Eurasian grape the only species ever domesticated.

Until now, the oldest jars known to have contained wine dated from 7,000 years ago, with six vessels containing the chemical calling cards of the drink discovered in the Zagros mountains in northern Iran in 1968.

"When we pick up a glass of wine and put it to our lips and taste it we are recapitulating that history that goes back at least 8,000 years," said Patrick McGovern a co-author of the study from the University of Pennsylvania museum of archaeology and anthropology, who also worked on the earlier Iranian discovery.

The find comes after a team of archaeologists and botanists in Georgia joined forces with researchers in Europe and North America to explore two villages in the South Caucasus region, about 50km south of the capital Tbilisi.

The sites offered a glimpse into a neolithic culture characterised by circular mud-brick homes, tools made of stone and bone and the farming of cattle, pigs, wheat and barley.

Researchers were particularly intrigued by fired clay pots found in the region – likely to be some of the earliest pottery made in the Near East. Indeed, one representative jar from a nearby settlement is almost a metre tall and a metre wide, and could hold more than 300 litres. What's more, it was decorated with blobs that the researchers say could be meant to depict clusters of grapes.

To explore whether winemaking was indeed a part of life in the region, the team focused on collecting and analysing fragments of pottery from two neolithicvillages, as well as soil samples. Radiocarbon dating of grains and charcoal nearby suggested the pots date to about 6,000–5,800 BC.

In total, 30 pottery fragments and 26 soil samples were examined, with the inside surface of the pottery ground down a little to produce a powder for analysis. While many of the pieces were collected in recent excavations, two were collected in the 1960s; researchers have long suspected they might bear traces of wine.

The team then used a variety of analytical techniques to explore whether the soil or the inner surface of the vessels held signs of molecules of the correct mass, or with the right chemical signatures, to be evidence of wine.

The results, published in the Proceeding of the National Academy of Sciences,reveal that for eight of the fragments, including the two previously unearthed, the team found traces of tartaric acid – a substance found in grapes in large quantities. Tests on the associated soils largely showed far lower levels of the acid. The team also identified the presence of three other acids linked to grapes and wine. Other evidence indicating the presence of wine included ancient grape pollen found at the excavated sites – but not in the topsoil – as well as grape starch particles, the remains of a fruit fly, and cells believed to be from the surface of grapevines on the inside of one of the fragments.

While the team note that it is possible that the vessels were used to store something other than wine, such as the grapes themselves, they note that the shape of the vessels is suited to holding a liquid and that grapes or raisins would have degraded without trace. Moreover, there are none of the telltale signs that the pots were used for syrup-making, while grape juice would have fermented within a matter of days.

The findings suggest the sites were home to the earliest known vintners, besting the previous record held by the traces of Iranian wine found just 500km away and dated to 5,400-5,000 BC. Older remnants of winemaking have also been found at the Jiahu site in China's Henan province, dating back to 7,000BC, but the fermented liquid appeared to be a mixture of grapes, hawthorn fruit, rice beer and honey mead.

With their narrow base, the large clay pots used do not stand up easily, suggesting they might have been half buried in the ground during the winemaking process, as was the case for the Iranian vessels and which is a traditional practice still used by some in Georgia.

Davide Tanasi, of the University of South Florida, said the results of the study were unquestionable and that the findings were "certainly the example of the oldest pure grape wine in the world".

The excavations in Georgia were largely sponsored by the National Wine Agency of Georgia.
"The Georgians are absolutely ecstatic," said Stephen Batiuk, an archaeologist from the University of Toronto and one of the study's co-authors. "They have been saying for years that they have a very long history of winemaking and so we're really cementing that position."

Please visit the site: https://www.theguardian.com/science/2017/nov/13/evidence-of-worlds-earliest-winemaking-uncovered-by-archaeologists

THESE MAY BE THE WORLD'S FIRST IMAGES OF DOGS—AND THEY'RE WEARING LEASHES, BY DAVID GRIMM

Carved into a sandstone cliff on the edge of a bygone river in the Arabian Desert, a hunter draws his bow for the kill. He is accompanied by 13 dogs, each with its own coat markings; two animals have lines running from their necks to the man's waist.

The engravings likely date back more than 8000 years, making them the earliest depictions of dogs, a new study reveals. And those lines are probably leashes, suggesting that humans mastered the art of training and controlling dogs thousands of years earlier than previously thought.

"It's truly astounding stuff," says Melinda Zeder, an archaeozoologist at the Smithsonian Institution National Museum of Natural History in Washington, D.C. "It's the only real demonstration we have of humans using early dogs to hunt." But she cautions that more work will be needed to confirm both the age and meaning of the depictions.

The hunting scene comes from Shuwaymis, a hilly region of northwestern Saudi Arabia where seasonal rains once formed rivers and supported pockets of dense vegetation. For the past 3 years, Maria Guagnin, an archaeologist at the Max Planck Institute for the Science of Human History in Jena, Germany—in partnership with the Saudi Commission for Tourism & National Heritage—has helped catalog more than 1400 rock art panels containing nearly 7000 animals and humans at Shuwaymis and Jubbah, a more open vista about 200 kilometers north that was once dotted with lakes.

Starting about 10,000 years ago, hunter-gatherers entered—or perhaps returned to—the region. What appear to be the oldest images are thought to date to this time and depict curvy women. Then about 7000 to 8000 years ago, people here became herders, based on livestock bones found at Jubbah; that's likely when pictures of cattle, sheep, and goats began to dominate the images. In between—carved on top of the women and under the livestock—are the early hunting dogs: 156 at Shuwaymis and 193 at Jubbah. All are medium-sized, with pricked up ears, short snouts, and curled tails—hallmarks of domestic canines. In some scenes, the dogs face off against wild donkeys. In others, they bite the necks and bellies of ibexes and gazelles. And in many, they are tethered to a human armed with a bow and arrow.

The researchers couldn't directly date the images, but based on the sequence of carving, the weathering of the rock, and the timing of the switch to pastoralism, "The dog art is at least 8000 to 9000 years old," Guagnin says. That may edge out depictions of dogs previously labeled the oldest, paintings on Iranian pottery dated to at most 8000 years ago.

"When Maria came to me with the rock art photos and asked me if they meant anything, I about lost my mind," says co-author Angela Perri, a zooarchaeologist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. Perri has studied the bones of ancient dogs around the world, and has argued that early dogs were critical in human

hunting. “A million bones won’t tell me what these images are telling me,” she says. “It’s the closest thing you’re going to get to a YouTube video.”

The ancient hunting dogs of Saudi Arabia (bottom) may have resembled the Canaan breed of dog (top).

The dogs look a lot like today’s Canaan dog, says Perri, a largely feral breed that roams the deserts of the Middle East. That could indicate that these ancient people bred dogs that had already adapted to hunting in the desert, the team reports this week in the Journal of Anthropological Archaeology. Or people may even have independently domesticated these dogs from the Arabian wolf long after dogs were domesticated elsewhere, which likely happened sometime between 15,000 and 30,000 years ago.

But Zeder notes that the engravings may not be as old as they seem. To confirm the chronology, scientists will need to link the images to a well-dated archaeological site—a challenge, she says, because “the archaeological record in this region is really spotty.”

Paul Tacon, an archaeologist at Griffith University in Gold Coast, Australia, agrees that “dating rock art is often a guestimate.” But based on his nearly 4 decades of studying such images around the world, he says, “Their chronology is sound.”

Even if the art is younger than Guagnin and her colleagues think, the leashes are by far the oldest on record. Until now, the earliest evidence for such restraints came from a wall painting in Egypt dated to about 5500 years ago, Perri says. The Arabian hunters may have used the leashes to keep valuable scent dogs close and protected, she says, or to train new dogs. Leashing dogs to the hunter’s waist may have freed his hands for bow and arrow.

But Tacon cautions that the lines in the engravings could be symbolic.
“It could just be a depiction of a bond.” Either way, he says, that bond was clearly strong, as the artists appear to have depicted dogs they actually knew, with particular coat patterns, stances, and genders. “These creatures were very important, beloved companions.”

Such a relationship would have been critical to helping people survive a harsh environment. Dogs could take down gazelles and ibexes too fast for humans, Perri says. Details of the images also suggest that the ancient hunters tailored their strategies to the landscape, Zeder says. At Shuwaymis, where the dogs may have been used to drive prey into the corners of uneven terrain, the art depicts large packs. At Jubbah, the images show smaller groups of dogs that may have ambushed prey at watering holes. “People were able to venture into these inhospitable areas by strategically marshalling dogs to survive,”
Zeder says. “And now we’re seeing a real picture of how it happened.”

Please visit the site: http://www.sciencemag.org/news/2017/11/these-may-be-world-s-first-images-dogs-and-they-re-wearing-leashes

ONE THOUSAND YEAR OLD EGGPLANT DISCOVERED IN ISRAEL

When did eggplants first arrive in Israel?

An 1,100-year-old refuse pit, discovered in archaeological excavations at the stepped street in the City of David in the Jerusalem Walls National Park, may provide an answer. Eggplant seeds were identified in the pit, which dates from the Early Islamic period (also called the Abbasid period – 750–940 CE). These seeds, the earliest evidence of eggplants known in this country, were found alongside thousands of grape seeds, olive and Christ's thorn jujube pits, black mulberries, lentils, figs and more. The refuse pit was uncovered in an Israel Antiquities Authority excavation on the stepped street in the City of David, in collaboration with the Israel Nature and Parks Authority and funded by the City of David Foundation.

According to Nahshon Szanton, excavation director for the Israel Antiquities Authority: "As a natural outcome of their activity, workshops and markets created a great deal of garbage that sometimes was buried in refuse pits and cesspits that were dug nearby.
Archaeological findings from the refuse pits provide tangible evidence of what written historical sources of the period have to say, and provide valuable information about the diet, lifestyle and economic and trade connections of the inhabitants of Jerusalem and neighboring countries 1,000 years ago. The eggplant seeds, which originated in Persia, are just one example of the research potential of ancient refuse."

In the refuse pit that was discovered along the Second Temple Period Pilgrimage Road in the City of David, was discovered various vessels.
Among them was an ancient lamp bearing the inscription "baracha" or blessing, in Arabic. Also found were bones from cattle, fish and birds, as well as many types of seeds.

These represent a variety of foods and vegetable products – legumes, fruit and vegetables, as well as edible wild grasses that were also used as spices and for medicinal purposes. The contents of the pit are now being studied intensively by Oriya Amichay and Nahshon Szanton for the Israel Antiquities Authority, in cooperation with Bar-Ilan University's Archaeobotany Laboratory, headed by Prof. Ehud Weiss.

According to the scholars Amichay and Szanton : "Finding thousands of grape seeds in refuse pit could attest to industrial activity involving grapes. Wine may have been produced here, or, more likely, grape honey (dibes). We know that with the Muslim conquest grape honey production became more prevalent in the area while wine production declined due to the Muslim religious ban on alcoholic beverages."

To the researchers' surprise, eggplant was also discovered among the many botanical species found in the pit. The discovery of the earliest eggplant seeds in this country and dating them to the Abbasid period provides important information about how eggplant first became part of local agriculture. According to the scholars: "The Arab conquest increased the extent of commerce in this country in general and in the Jerusalem area in particular. This gradual process led to changes in the diet of the local inhabitants due to

the arrival of new species and tastes in our region, in addition to those already familiar in the local cuisine up to that time."

Grape seeds found in the Abbasid refuse pit.

The scholars note that the botanical finds were uncovered due a rare mineral phenomenon: "In Israel, organic finds are usually preserved if they become carbonized as the result of a fire or when the site is in an area where weather conditions delay the breakdown of the material (for example in the Judean Desert). In contrast to these types of preservation, the botanical finds in the refuse pit on the stepped street in the City of David, like material found in refuse pits discovered in the past in excavations at the nearby Givati Parking Lot, were preserved in a unique way: The components of the seeds underwent a mineral process that rendered them inorganic – their outer form did not change and the seeds did not decompose, but rather were preserved in the pit until they were recovered during the excavation.

Please visit the site: http://www.jewishpress.com/news/israel/one-thousand-year-old-eggplant-discovered-in-israel/2017/11/16/

SKELETONS COULD PROVIDE CLUES TO WHO WROTE OR PROTECTED THE DEAD SEA SCROLLS - FEW WOMEN OR CHILDREN HAVE BEEN FOUND AT QUMRAN BURIAL SITE, SUGGESTING SIMILARITIES TO BYZANTINE MONASTERY CEMETERIES, BY BRUCE BOWER

A decades-long debate over who once occupied a settlement located near the caves where the Dead Sea Scrolls were found has taken a chaste turn.

Analyses of 33 newly excavated skeletons of people buried at the West Bank site, Qumran, supports a view that the community consisted of a religious sect of celibate men. Anthropologist Yossi Nagar of the Israel Antiquities Authority in Jerusalem presented the findings November 16 at the annual meeting of the American Schools of Oriental Research. Preliminary radiocarbon dating of one of the Qumran bones indicates that the interred bodies are around 2,200 years old — close to the same age as the ancient texts, which are estimated to have been written between around 150 B.C. and A.D. 70.

Plus, reexamination of 53 previously unearthed human skeletons from Qumran's cemetery, now housed in France, found that six of seven individuals formerly tagged as women were actually men, Nagar said. A small number of children have also been excavated at Qumran.

Israel Antiquities Authority anthropologists Hanania Hizmi and Yevgeny Aharonovich directed the latest excavations at Qumran in 2016. The researchers called in Nagar to study the skeletons. He identified 30 of the newly excavated individuals as definitely or probably males, based on factors that include pelvic shape and body sizes. (There was not enough evidence to assign a sex to the remaining three.) At the time of their deaths, the men ranged in age from around 20 to 50 or more, Nagar estimated.

"I don't know if these were the people who produced the Qumran region's Dead Sea Scrolls," Nagar said. "But the high concentration of adult males of various ages buried at Qumran is similar to what has been found at cemeteries connected to Byzantine monasteries." The Byzantine Empire, founded in A.D. 330, was an extension of the Roman Empire in the eastern Mediterranean.

Earlier investigations of Qumran suggested it was founded more than 2,700 years ago. Warfare led to its abandonment before it was settled again for about 200 years, up to around the year A.D. 68.

Discovery of the Dead Sea Scrolls, which include parts of the Hebrew Bible, in 11 nearby caves between 1947 and 1956 stimulated intense interest in who had occupied

Qumran. In February of 2017, researchers revealed they had found another cave in the same area that possibly held scrolls or pieces of papyrus and leather intended to be written on.

An influential early theory held that members of an ancient, celibate Jewish sect, the Essenes, lived at Qumran and either wrote the Dead Sea Scrolls or were caretakers of these religious, legal and philosophical documents. But over the past 30 years, other possible inhabitants of Qumran have been proposed, including Bedouin herders, craftsmen and Roman soldiers.

Qumran individuals show no signs of war-related injuries and are not predominantly young adult men, as would be expected of a cemetery for soldiers, Nagar said. The Qumran skeletons can't be confirmed as Essenes, but their identity as part of a community of celibate men appears probable, he added.

Extraction and analysis of DNA from the Qumran skeletons would help confirm that they are all, or almost all, men, said Jonathan Rosenbaum, a professor of Jewish Studies at Gratz College in Melrose Park, Penn.

Researchers removed small samples of bone from some of the newly excavated Qumran skeletons before reburying the finds in their original resting places. Nagar wasn't sure if any attempts to retrieve DNA from bone samples would be launched.

Please visit the site: https://www.sciencenews.org/article/skeletons-could-provide-clues-who-wrote-or-protected-dead-sea-scrolls