Επιστημονικό Σωματείο,
Έτος Ίδρυσης 1982, έδρα:
Κάνιγγος 27, 106 82 Αθήνα
(Ένωση Ελλήνων Χημικών)
http://archaeometry.org.gr

Scientific Association, Year of Establishment 1982, Headquarters: Kaniggos 27, 106 82 Athens (Association of Greek Chemists)
http://archaeometry.org.gr

Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Μάρτιος 2023 -

You don't develop courage by being happy in your relationships every day. You develop it by surviving difficult times and challenging adversity. (*Epicurus*)

Newsletter of the Hellenic Society of Archaeometry

- March 2023 -

Nr. 264

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RAA2023 – SPECIAL ISSUE NOTIFICATION AND ABSTRACT SUBMISSION REMINDER

Dear Raman Enthusiasts!

We are excited to announce some great news regarding the publication connected to the 11th International Conference on the Application of Raman Spectroscopy in Art and Archaeology (RAA2023). The RAA2023 conference will be hosted by the National Gallery-Alexandros Soutzos Museum, Athens, Greece, in collaboration with Ghent University, Belgium.

Journal of Raman Spectroscopy (JRS) will continue the tradition of supporting the RAA conferences.

We are honored to announce that Journal of Raman Spectroscopy (JRS) will support the RAA2023 conference through a special issue. Original studies of high scientific quality presented at the RAA2023 conference are candidates for publication in the JRS special issue. The guest editors of this JRS special issue are Prof. Dr. Juan Manuel Madariaga and Dr. Anastasia Rousaki.

More details, regarding the important dates and submission process associated with the JRS special issue, will be communicated in due time.

For the abstract submission, please note that all abstracts should be submitted before 19th March 2023. This submission deadline is definitive and no extension is foreseen after this date. The abstracts must be submitted via the online system of the RAA2023 web page.

Further information, will be regularly updated on the conference website https://www.raa2023.ugent.be/.

For any questions do not hesitate to contact the conference chairs and the organizing committee by email to raa2023@ugent.be.

On behalf of the organizing committee of the 11th International Conference on the Application of Raman Spectroscopy in Art and Archaeology (RAA2023).

The Chairs of RAA2023

Dr. Anastasia Rousaki, Ghent University, Ghent, Belgium
&
Dr. Eleni Kouloumpi, The National Gallery-Alexandros Soutzos Museum, Athens, Greece

IRUG15 CONFERENCE & WORKSHOP, 25-29 SEPTEMBER 2023, TOKYO, JAPAN

Tokyo University of the Arts (Geidai), the Tokyo National Research Institute for Cultural Properties (Tobunken), and the Infrared and Raman Users Group (IRUG) are excited to confirm that the 15th IRUG International Conference will take place in the week **25-29 September 2023, in Tokyo, Japan** (the week after the SWBSS Conference in Nara, Japan and ICOM-CCs 20th Triennial Conference in Valencia, Spain). Papers and posters are invited on all aspects of IR and Raman spectroscopies and their application to the study of cultural heritage, with submissions on attenuated total reflection (ATR) or reflectance mode techniques encouraged. The in-person conference (Covid developments permitting) will also feature a **workshop on portable ATR and reflectance instruments** with emphasis on data acquisition, processing, and interpretation. The deadline for submission of abstracts (in English, no more than 1000 words please) and titles is **30 March 2023** and should be sent as an email attachment to **IRUG15@ml.geidai.ac.jp**. Further conference information and details will follow!

7TH EDITION OF INTERNATIONAL MEETING ON RETOUCHING OF CULTURAL HERITAGE (RECH7 – 2023), OCTOBER 12-13, 2023, LISBON, PORTUGAL, CALL FOR ABSTRACTS

CALL FOR PARTICIPATION

DEADLINE: MAY 31ST 2023

DATE: OCTOBER 12-13, 2023

PLACE: Faculty of Fine Arts | University of Lisbon, Portugal - LAGOA HENRIQUES AUDITORIUM

The RECH Group are pleased to announce the Call for Abstracts of the ***7th edition of International Meeting on Retouching of Cultural Heritage (RECH7 – 2023)***.

For those who don't know RECH yet, RECH Biennial Meeting is one of the largest educational and scientific events in chromatic reintegration field, an ideal venue for students, conservators, and scientists to present their research results about this topic.

After three editions in Porto, Portugal, the 4th edition in Split, Croatia, the 5th edition in Università degli Studi di Urbino "Carlo Bo", in Italy, and the 6th in collaboration with the Instituto Universitario de Restauración del Patrimonio (IRP) of the Universitat Politècnica de València, Spain, this year, this Meeting will be at the Faculty of Fine Arts of the University of Lisbon (FBAUL), in Portugal.

Please visit the WEBSITE for more information.

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Ana Bailão
Assistant Professor
Universidade de Lisboa, Faculdade de Belas Artes, Departamento de Ciências da Arte e do Património
Lisboa

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CLARA2 CONFERENCE, MEXICO, SEPTEMBER 4TH TO 8TH, 2023, MEXICO CITY, MEXICO

Dear All,

We are excited to announce the upcoming CLARa2 Conference, taking place in the vibrant city of Mexico City, Mexico, from September 4th to 8th, 2023. Conveniently located in the heart of downtown, the conference aims to bring together the international and Latin American radiocarbon communities to exchange ideas and address various challenges and applications of the radiocarbon technique from multiple perspectives.

The conference program will feature a mix of invited lectures, and oral and poster presentations, allowing attendees to participate in discussion. In addition, the conference proceedings will be published in a special issue of Radiocarbon.

In addition to the rich academic program, you will also enjoy the many cultural and historical attractions that Mexico City offers. We are confident that your time spent at the CLARa2 Conference will be a truly memorable experience.

You can visit the website for the list of sessions: https://clara2.fisica.unam.mx/en/sessions

You can now send the abstract on the following page: https://clara2.fisica.unam.mx/en/abstract

Important dates:
February 2023: Sessions announced, abstract submission opens.
22 March 2023: Registration will open.
May 2023: Abstracts submission deadline.
June 2023: Decision Letters sent, and Early Bird Registration.

4 September: Conference starts.	**Price (until 30 June)**	**Price (after 30 June)**
Registration type		
Full	400	450
Student*	200	240
Companion	200	240

We hope you will be able to join us and that we will meet again in person.

The organizer committee.

Please visit the site: https://clara2.fisica.unam.mx/en/home

«ΓΕΦΥΡΕΣ ΑΡΧΑΙΟΜΕΤΡΙΑΣ», 28/04/2023, ΑΙΘΟΥΣΑ Μ. ΑΝΔΡΟΝΙΚΟΥ, ΑΡΧΑΙΟΛΟΓΙΚΟ ΜΟΥΣΕΙΟ ΘΕΣΣΑΛΟΝΙΚΗΣ

Αγαπητές/οί συνάδελφοι,

Η Ελληνική Αρχαιομετρική Εταιρεία, στο πλαίσιο των δράσεων που διοργανώνει, σας προσκαλεί να συμμετάσχετε στον κύκλο εκδηλώσεων με τίτλο: **«Γέφυρες Αρχαιομετρίας»**.

Στόχος αυτής της δράσης είναι να καταγραφούν οι ενεργές ομάδες που δραστηριοποιούνται στον χώρο της Αρχαιομετρίας και ανήκουν σε ακαδημαϊκά ιδρύματα, φορείς πολιτισμού και ερευνητικά κέντρα της χώρας. Επιπλέον, στόχο αποτελεί η έναρξη διαλόγου ανάμεσα στις κατά τόπους ομάδες και η δημιουργία πιθανών συνεργειών στον χώρο της Αρχαιομετρίας. Τελικός σκοπός είναι η έναρξη της ζύμωσης για τη δημιουργία Εθνικού Κόμβου για την Πολιτιστική Κληρονομιά.

Οι «Γέφυρες Αρχαιομετρίας» θα ταξιδέψουν αρχικά στην ελληνική περιφέρεια. Η πρώτη Γέφυρα θα πραγματοποιηθεί στη Θεσσαλονίκη στις **28/04/2023,** στην αίθουσα Μ. Ανδρόνικου του Αρχαιολογικού Μουσείου Θεσσαλονίκης.

Σας προσκαλούμε, λοιπόν, να συμμετάσχετε στην 1η «Γέφυρα Αρχαιομετρίας» και να επιλέξετε τα μέλη της ομάδας σας που θα σας εκπροσωπήσουν στη συζήτηση, με μορφή επιτροπής (πάνελ) και με άξονες/ θεματικές ενότητες:

1. Έρευνα
2. Εκπαίδευση
3. Χρηματοδότηση
4. Υποδομές/ Εξοπλισμός
5. Πρότυπα/ Υποδομές

Η εκδήλωση θα είναι ανοιχτή για παρακολούθηση στα μέλη όλων των ομάδων.

Σας παρακαλούμε να εκδηλώσετε το ενδιαφέρον σας κοινοποιώντας τα ονόματα των εκπροσώπων της ομάδας σας στις αντίστοιχες θεματικές ενότητες μέχρι την Παρασκευή, 10/03/2023.

Η συνάντηση θα είναι υβριδική με δυνατότητα αμφίδρομης εξ αποστάσεως συμμετοχής. Ενθαρρύνεται η δια ζώσης παρουσία.

Με εκτίμηση,

Το Διοικητικό Συμβούλιο της ΕΑΕ

ARCHAEOLOGY OF THE NEAR EAST AND VIDEO GAMES ASOR ANNUAL MEETING, CHICAGO (HYBRID) - NOVEMBER 15-18, 2023, CALL FOR PAPERS

Session Chair: Tine Rassalle (Museum of the Southern Jewish Experience)

For centuries, the written word was the preferred medium for transferring archaeological academic knowledge to the broader public. With the advent of modern communication technology like radio, TV, and the internet the possibilities to interact with the audience were broadened. Video games have since the 1980's been a part of this new wave of telecommunication, but they remain underrepresented as a field of study in academic scholarship. In this session, we aim to correct this by offering a multidisciplinary discussion of theoretical and methodological approaches to the study of archaeology and video gaming. Archaeogaming, as it is often called, is a systematizing framework that includes the use of archaeological methods within game worlds, the creation of video-games for, or about, archaeological practices, or the critical study of how archaeology is represented in video-games.

Themes can include using archaeological tools and methods to conduct archaeological investigations into synthetic worlds, exploring heritage through play, and the use and ethics of virtual reality in digital spaces. In this session, we aim to present a diverse array of topics that sit on the intersection of the archaeology of the Near East and video games, opening up debate on the multifunctionality of this medium for research, education and heritage management.

Abstracts may be submitted now (https://www.asor.org/am/2023/call-for-papers-2023).

Abstracts of 250 words or less should be submitted via ASOR's Online Abstract Management System at https://auth.oxfordabstracts.com/?redirect=/stages/5638/submitter. The deadline for submissions is March 15, 2023.

Please note that in order to present a paper at the Annual Meeting, you must be a current member of ASOR (http://www.asor.org/membership/) and must register for the Annual Meeting when submitting your abstract.

Scholarships through ASOR are available to cover all or part of the registration fee. Contact programs@asor.org with requests and a brief explanation.

For any questions, feel free to contact the session chair Tine Rassalle at tinerassalle@hotmail.com

CALL FOR PAPERS: 2023 ASOR ANNUAL MEETING NOVEMBER 15–18 CHICAGO AND HYBRID VIRTUAL

We invite abstract submissions for in-person or virtual papers to be presented in our session Environmental Archaeology of the Ancient Near East at the 2023 ASOR Annual Meeting.

This session accepts papers that examine past human-environment interactions and human resource (flora and fauna) use across ancient Western Asia and the Mediterranean. Topics may include archaeobotany/paleoethnobotany, zooarchaeology, and geoarchaeology, including macrobotanical studies, anthracology, dendrochronology, pollen, phytolith and other micro-remain analyses, geochemical approaches, isotope analyses, and other archaeological science methods engaging with humans and the environment. In addition to methodological topics, the session also welcomes papers that focus on broader theoretical and historical debates. Papers from early career and internationally based researchers are especially welcome.

Abstracts may be submitted now through March 15 (https://www.asor.org/am/2023/call-for-papers-2023)

Submit your abstract (max. 250 words) to ASOR's Online Abstract Management System and make sure to select the "Environmental Archaeology of the Ancient Near East" session from the drop-down list.
(https://auth.oxfordabstracts.com/?redirect=/stages/5638/submitter)

Please note that in order to present a paper at the Annual Meeting, you must be a current member of ASOR (http://www.asor.org/membership/) and must register for the Annual Meeting when submitting your abstract

Scholarships through ASOR are available to cover all or part of the registration fee. Contact programs@asor.org with requests and a brief explanation.

Please feel free to contact session chairs Brita Lorentzen (Brita.Lorentzen@uga.edu) or Elise Laugier (elise.laugier@rutgers.edu) with any questions.

CALL FOR PAPERS SESSION CULTURAL HERITAGE: PRESERVATION, PRESENTATION, AND MANAGEMENT, 2023 ASOR ANNUAL MEETING, NOVEMBER 15–18, 2023, CHICAGO & VIRTUAL

Session Chair: Kiersten Neumann, Oriental Institute, University of Chicago

Session Description: This session explores theory and practice in the areas of archaeological site and collections conservation, presentation, education, and management. Discussion of community-engaged projects is especially welcome.

Abstracts may be submitted now through March 15
https://www.asor.org/am/2023/call-for-papers-2023

Submit your abstract (max. 250 words) to ASOR's Online Abstract Management System https://auth.oxfordabstracts.com/?redirect=/stages/5638/submitter

For questions, please contact the session chair Kiersten Neumann (neumann@uchicago.edu)

This ASOR Standing Session is posted at
https://www.asor.org/am/2023/approved-sessions-2023#casestudies

Please note that in order to present a paper at the Annual Meeting, you must be a current member of ASOR (http://www.asor.org/membership/) and must register for the Annual Meeting when submitting your abstract https://www.asor.org/am/2023/annual-meeting-registration-2023

CALL FOR PAPERS: PROTECT AND SECURE. TECHNOLOGY OF DATA PROTECTION IN THE ANCIENT NEAR EAST, 2023 ASOR ANNUAL MEETING, NOVEMBER 15-18, 2023, CHICAGO & HYBRID

We invite submissions of abstracts for papers for the session "Protect and Secure. Technology of Data Protection in the Ancient Near East", organized as the part of the 2023 ASOR Annual Meeting, which will take place in a hybrid format November 15-18 (in person at the Hilton Chicago). Submissions are encouraged from scholars from all fields of Ancient Near Eastern Studies.

Session chairs: Jana Mynářová (Charles University, Prague) and Jacob Lauinger (The Johns Hopkins University)

Presentations and discussion that took place during the Secure Your Data! Security and Data Management in the Ancient Near East session, which was held at the 2022 ASOR Annual Meeting in Boston, clearly demonstrated that data security and management are crucial topics in Ancient Near Eastern Studies that have not yet received adequate attention. In particular, issues about methods of data protection, such as baking cuneiform tablets or the production of clay envelopes for cuneiform tablets, were a common theme in the papers and generated very lively discussion. For this reason we would like to organize a second session that focuses specifically on the Technology of Data Protection in the ANE for the 2023 ASOR Annual Meeting. Submissions would be encouraged from scholars from all fields of Ancient Near Eastern Studies, and we would specifically hope for a good balance of scholars working on texts and on material culture. If 2022 demonstrated the urgency of the topic, and 2023 will focus on technological aspects, in 2024, we would hope to study cultural (dis)continuities in data security and practices.
https://www.asor.org/am/2023/approved-sessions-2023

The deadline for submission of abstracts is March 15, 2023. Please contact Jana Mynářová (jana.mynarova@ff.cuni.cz) or Jacob Lauinger (jlauing1@jhu.edu) if you have any questions.

To submit your abstract (max. 250 words), please, use the ASOR's Online Abstract Management System at https://auth.oxfordabstracts.com/?redirect=/stages/5638/submitter and choose the "Protect and Secure" session.

We would like to kindly remind you that both your membership in ASOR and registration for the 2023 ASOR Annual Meeting are required at the time of abstract submission. You can find all necessary information at the ASOR Annual Meeting website (https://www.asor.org/am/).

JOINT ICTP-IAEA ADVANCED WORKSHOP ON ACCELERATOR MASS SPECTROMETRY RADIOCARBON DATING FOR HERITAGE AND FORENSIC SCIENCES, 22–26 MAY 2023, TRIESTE, ITALY

WEBSITE: http://indico.ictp.it/event/10173/

DESCRIPTION:
The in-person workshop will provide an advanced training and information exchange platform. The workshop seeks to review the state-of-the-art in the area of analysis with the emphasis on the newest development and trends. Novel applications, guidelines, protocols to improve radiocarbon dating will be presented. Several case studies in the field of heritage and forensics sciences will be discussed.

The recently published IAEA e-learning on radiocarbon dating technique is available:
https://elearning.iaea.org/m2/course/view.php?id=1499

A poster session will be organised to present and discuss the participants' research results.

The workshop is open both for young and experienced scientists, archaeologists, curators, forensic experts/law-enforcement actors, and policy makers interested in this quickly evolving subject.

TOPICS:
• State of the Art of accelerator mass spectrometry radiocarbon dating
• Sample preparation and chemistry for radiocarbon dating
• Analysis and interpretation of the radiocarbon data
• Case studies on radiocarbon dating in heritage science: paintings, pigments, organic dyes, mortars, iron artifacts, rock art and natural landscape
• Case studies on radiocarbon dating in forensic science for authentication, detecting illicit trade and police cases: art objects, documents, food, medicine, wildlife, soft tissue, forensic anthropology
• Future trends, ethical considerations, scientific challenges and possible solutions.

HOW TO APPLY:
Online application: http://indico.ictp.it/event/10173/
Female scientists are encouraged to apply.

DEADLINE:
15 March 2023

GRANTS:
A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries.

FEE:
There is no registration fee.

DOWNLOAD THE INFORMATIONAL POSTER:
https://indico.ictp.it/event/10173/material/poster/

Directors:
L. BASSEL, IAEA, Austria
A. J. T. JULL, Geosciences, University of Arizona, USA
A. SIMON, IAEA, Austria

Local Organiser:
R. KAISER, ICTP, Italy

Speakers:
L. CALCAGNILE, CEDAD, University of Salento, Italy
E. DELQUE-KOLIC, LMC14, University Paris-Saclay, France
M. FEDI, INFN, Italy
I. HAJDAS, ETH Zürich, Switzerland
M. HUELS, University of Kiel, Germany
M. MOLNAR, ATOMKI-HAS, Hungary
G. QUARTA, CEDAD, University of Salento, Italy
A. QUILES, IFAO, Egypt
F. ZANINI, Elettra – Sincrotrone, Italy

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ – JOB VACANCIES/FELLOWSHIPS

FITCH LABORATORY BURSARY AWARDS 2023-2024

Applications are invited from graduate students or young scholars for an award to support research at the Fitch Laboratory, British School at Athens (BSA) for up to 3 months in the academic year (September 2023-July 2024) in any of the fields in which the Laboratory is active (e.g. ceramic studies, archaeometallurgy, geophysical prospection, zooarchaeology, archaeobotany, soil micromorphology, ethnoarchaeology, landscape archaeology, archaeology of technology; normally in the context of Aegean/Mediterranean archaeology). The Bursary includes a monthly stipend (400€), BSA membership and accommodation at the BSA Hostel in Athens and, if required for research purposes, also in Knossos. The award holder will be required to submit a report on her/his research at the Laboratory to the Laboratory's Subcommittee and Director.

The successful applicant will be expected to use the facilities of the Fitch Laboratory (including analytical equipment and reference collections) as well as the BSA library to further on-going work, in the context of a postgraduate degree or postdoctoral research. No bench fee charges will be applied but the bursary holder will need to cover the expenses of any planned sample preparation or analysis. The award carries no other formal obligation, although involvement in the academic life of the BSA (for example in the form of a seminar) is welcome.

Applications should include a covering letter (indicating the preferred length and period of stay), a Curriculum Vitae, a statement of the proposed programme of research and a title (up to one page) and the names and contact details of two referees. Applicants should ask referees to send their recommendations by the deadline. The successful applicant will be responsible for acquiring on time any required permits for study and transfer of archaeological material to the Fitch Laboratory. If the use of in-house analytical facilities is necessary for the proposed research, applicants are advised to contact the Laboratory Director to get feedback on analytical costs and timing; the latter mainly in relation to the WD-XRF analysis.

Potential applicants may contact Dr Evangelia Kiriatzi, the Laboratory Director (e.kiriatzi@bsa.ac.uk), for further information. Additional details about the School and the Laboratory can be found at http://www.bsa.ac.uk/ .

If you are interested in applying for an award, please check our website on how to apply (https://www.bsa.ac.uk/awards/bursaries/fitch-bursaries/).
Applications should be submitted by 12th May 2023.

JOB OPPORTUNITIES AT THE V&A - CONSERVATION SCIENTIST

The V&A is looking for a Conservation Scientist to join its Conservation team.

The V&A is the world's leading museum of art, design and performance, housing a collection of over 2.8 million objects that document 5,000 years of human creativity from across six continents. The Museum holds many of UK's designated National Collections, including sculpture, ceramics, metalwork, textiles and furniture, and including extensive collections of prints, drawings, posters, photographs and portrait miniatures. It is also home to the National Art Library, which holds the UK's most comprehensive public reference library for the fine and decorative arts, as well as special collections of the art of the book ranging from the Middle Ages to the present day. The V&A's Archive Collections hold extensive archives of over 1,000 individuals, associations and companies involved in the fields of art, design and performance, documenting process and practice.

As Conservation Scientist you will have the exciting opportunity to work in our newly-refurbished laboratory, where a AHRC £2.3 million grant has enabled the purchase and upgrade of a wide range of microscopes, spectrometers and X-radiography equipment. With experience in the analysis of materials from cultural heritage contexts, as Conservation Scientist you will undertake the analysis of organic, polymeric and modern materials as well as other traditional materials in museum objects, using FTIR, X-ray fluorescence, SEM-EDX, UV-vis-nIR, optical and digital microscopy, Raman microscopy and other appropriate techniques. You will undertake and support research enabling the delivery of the museum's public programme and strategic objectives in care of collections and research. You will be active in publications, presentations, contribute to the V&A's blog and public events.

For more information visit our website.

POSTDOCTORAL RESEARCHER IN CONSERVATION SCIENCE, UNIVERSITY OF DELAWARE

The Department of Art Conservation at the University of Delaware is seeking a postdoctoral researcher for a 2-year research and teaching position in the field of conservation science. This is a term position with a tentative start date of mid-August 2023.

The successful candidate will work at Winterthur Museum, Garden and Library in partnership with the University of Delaware, reporting to the head of the Scientific Research and Analysis Laboratory.

Responsibilities

The researcher will:
- Work with conservation scientists, conservators, curators, and conservation and material culture fellows at Winterthur and the University of Delaware on research projects inspired by a broad range of materials from the collections of Winterthur Museum, Garden & Library, and partner institutions.
- Provide analytical services to the Museums' conservators, curators, and conservation and material culture fellows;
- Engage with academic and public audiences on a regular basis through museum and university educational programs;
- Teach a three-credit course "Scientific Theory for Conservation Practice" in the Fall and Spring within the first year curriculum of the Winterthur/University of Delaware Program in Art Conservation. This will involve collaborating with faculty to revise the existing course syllabus, organize guest lecturers, if applicable, and prepare and revise course materials, including lectures, reading lists and assessment.
- Depending on the researcher's interests and career goals there may be an option for additional teaching at the undergraduate level, or prioritizing scholarly publications.

Qualifications

A STEM Ph.D. is required.

The successful candidate will have a demonstrated, high level of scientific achievement, and be sincerely motivated to pursue a career as a scientist in the field of cultural heritage. Experience with some spectroscopies and/or chromatographic techniques are required, while advanced computational and statistical analysis skills are desirable. Strong oral and written communications skills and a record of publication and public outreach is part of what defines a candidate ready for the responsibilities of this position. An interest in teaching and mentorship is essential. The candidate will share interest in arts and culture, and a commitment to the preservation of cultural heritage.

Equal Employment Opportunity: The University of Delaware is an Equal Opportunity Employer and encourages applications from members of underrepresented groups. The

University's Notice of Non-Discrimination can be found at http://www.udel.edu/aboutus/legalnotices.html

Salary and benefits: $59000 with benefits. Professional development and travel funding will be provided.

How to apply: University of Delaware - Details - Post Doctoral Researcher, Art Conservation

Any questions? Reach out to Dr Rosie Grayburn rgrayb@udel.edu

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Rosie Grayburn
Associate Scientist
Winterthur Museum, Garden & Library
Winterthur DE

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THE WESTON HERITAGE INTERNSHIP PROGRAMME AT THE MARY ROSE TRUST

We are delighted to announce the second year of The Weston Heritage Internship Programme at the Mary Rose Trust. This programme gives those studying in relevant disciplines the opportunity to experience working in the heritage sector as part of a paid internship.

This programme was made possible by generous support from The Garfield Weston Foundation.

The internships cover a variety of disciplines related to understanding and caring for our collection and associated archive. For Summer 2023 the Mary Rose Trust is offering the following 12-week positions starting 19th June until 8th September 2023;

Collections Development and Curatorial Intern (2 positions)

Conservation and Heritage Science Intern (2 positions)

Please find more details and how to apply online maryrose.org/recruitment/#academic

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Sarah Coggins
Conservation Engineer
+44 (0)23 9275 0521 ext 2309
07470 044624
maryrose.org

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JOB OPENING AT THE GCI - SENIOR SPECIALIST- ARCHEOLOGICAL SITE CONSERVATION AND MANAGEMENT

I am attaching the post for the position opening I have in my department for a senior person to join us. Essentially, I am looking for someone who can vision, develop, plan and manage archeological site projects and also develop other strategic aspects of related works such as training, publications and so on. It is LA based but will involve travel.

If you can think of anyone, please pass it on or feel free to let me know.

Here is the link: https://jobs-getty.icims.com/jobs/4119/senior-project-specialist/job

Best to you all!

Susan

****

Susan Macdonald
Head Buildings and Sites
Getty Conservation Institute
www.getty.edu/conservation
smacdonald@getty.edu
Tel: +1 310 4406245

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THREE ASSISTANT SCIENTIST POSITIONS AT GETTY CONSERVATION INSTITUTE

The Getty Conservation Institute invites applications for three (3) Assistant Scientist positions in our Science department.

Hiring Pay Scale: $66,156 - $86,015 annually, commensurate with experience and internal equity

Deadline for applications: April 3, 2023

We are looking for an Assistant Scientist to provide analytical and research support in the Getty Conservation Institute's Science Department, as part of the Preventive Conservation Research team. Initially, you will work on our Managing Collections Environments Initiative, which combines research, education, and field activities to address technical and practical issues pertaining to the sustainable control and management of collection environments in museums, libraries, and archives, of all sizes and resource levels, and in all geographic regions. Your work will be based in our laboratories and offices at the Getty Center in Los Angeles.

For more details and to apply: Assistant Scientist (Preventive Conservation Research)

We are looking for an Assistant Scientist to provide analytical and research support in the Getty Conservation Institute's Science Department, as part of the Technical Studies Research team, which conducts scientific research on works of art, with conservators and curators, to improve the understanding and preservation of works in the collections of the Getty Museum and other institutions. Your work will be based in our laboratories and offices at the Getty Center in Los Angeles.

For more details and to apply: Assistant Scientist (Technical Studies Research)

We are looking for an Assistant Scientist to provide analytical and research support in the Getty Conservation Institute's Science Department, as part of the Built Heritage Research team, which combines laboratory research and field studies to characterize traditional and modern built heritage materials and to investigate conventional and innovative conservation treatments for such materials. Your work will be based in our laboratories and offices at the Getty Center in Los Angeles.

For more details and to apply: Assistant Scientist (Built Heritage Research)

Questions?

Email gcistaffing@getty.edu

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Anna Duer
Reference Librarian
Getty Conservation Institute

Los Angeles, CA
aduer@getty.edu

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POSTDOCTORAL POSITION IN RADIOCARBON AND ARCHAEOLOGY IN KIEL, GERMANY

Position vacant:
Full-time postdoctoral researcher in radiocarbon and archaeology

Based in Kiel, Germany

From 1 May to 31 December 2023.

Closing date 12 March 2023.

For more details, see https://osf.io/wvdyj/files/osfstorage/63ef4a7beeb8ff07eb21046b

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

FITCH LABORATORY, BSA - GLASS IN THE MEDITERRANEAN AND THE NEAR EAST - TRAINING COURSE, 19 - 23 MAY 2023

IMPORTANT NOTICE: REGISTRATION EXTENDED, 13th MARCH 2023

Archaeology and Archaeometry from the Late Bronze Age to the early Medieval period

This five-day course provides an introduction to archaeological glass, its typology, technology, composition and chronological development. It will be of interest to students, early career researchers and others who wish to engage with current research on ancient glass. It comprises daily lectures (20 hours), glass handling sessions, workshops/demonstrations on chemical analysis and scanning electron microscopy of glass, as well as a museum visit (10 hours).

The course co-coordinators and instructors are Dr. Yael Gorin-Rosen (Israel Antiquities Authority, Jerusalem) & Prof. Ian Freestone (UCL Institute of Archaeology, London) with contribution by Dr. Carlotta Gardner (Fitch Laboratory, British School at Athens).

Course Fee: *The course fee includes tuition, teaching materials, coffee/tea and snacks, and a farewell meal, plus BSA membership for a month with 24- hour access to the superb library and entry to archaeological sites and public museums in Greece. It also covers self-catering, shared accommodation in double rooms (including breakfast) for six nights at the BSA Hostel. The fee is 580€. Please check the BSA's website for further information (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.bsa.ac.uk%2Fmember-services%2Faccommodation%2F&data=05%7C01%7Caegeanet%40lists.ku.edu%7Cfdfa78720a12488c5f5208db165197a7%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638128311932569579%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=JBRtL0iF%2Fm%2FtgQDt2JSNibCUfMYzA6%2FIDDeyef5wRbg%3D&reserved=0). Travel to and from Athens and health insurance are the sole responsibility of the course participant.

The course is limited to 12 places. The successful candidates will be informed by late March 2023. Post-graduate students are recommended to apply to their universities for financial support.

If you wish to apply, please check the relevant section on the British School at Athens web page (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.bsa.ac.uk%2Fcourses%2Fglass-in-the-mediterranean-and-the-near-east%2F&data=05%7C01%7Caegeanet%40lists.ku.edu%7Cfdfa78720a12488c5f5208db165197a7%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638128311932569

579%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=iyqjYkYBUMdEUeHpEqYVlCb5NQhlLbEGxPrgtwLsF5M%3D&reserved=0). Deadline: 13 March 2023.

For further information, contact either of the two course coordinators, Prof . Ian Freestone (i.freestone@ucl.ac.uk) or Dr. Yael Gorin-Rosen (yael.gorin.rosen@gmail.com).

Biographies

The course tutors have collaborated on glass projects for two decades. Their early papers on the archaeology and archaeometry of Levantine glass production are widely cited and articulated a production model which has now become widely accepted.

Yael Gorin-Rosen is a leading specialist in ancient glass. She established the Glass Department of the Israel Antiquities Authority in 1991 and has headed it since then. From 1996 to 2002, she taught ancient glass at the Bezalel Academy of Art and Design in Jerusalem, where in 2017-2019 she is an invited lecturer. She taught at the University of Haifa during 2017. Yael Go rin-Rosen has participated in and supervised several excavations, including the biggest ancient glass production site ever excavated in the world: the r aw glass industry at Bet Eli‘ezer, Hadera (1992) and more recently the raw g lass furnaces at Jalame (2015−2016). She has published more than 150 reports on glass vessels from excavations in Israel, dating from the Hellenistic period to the Middle Ages.

Ian Freestone joined the Institute of Archaeology London as Professor of Archaeological Materials and Technology in 2011. From 1979 he worked in the B ritish Museum as a research scientist, then moved to Cardiff University in 2 004, where he was first Professorial Research Fellow then Head of Archaeology. He has published extensively on early glass and ceramics and is a recipient of the Archaeological Institute of America’s Pomerance Medal for scientific contributions to archaeology. He is a member of the editorial boards of Archaeometry, the Journal of Archaeological Science and Journal of Glass Studies.

INTRODUCTION TO BIOARCHAEOLOGY COURSE 2023 - THE M.H. WIENER LABORATORY FOR ARCHAEOLOGICAL SCIENCE, ASCSA

Dear colleagues,

I would like to bring to your attention the 2023 course of the M.H. Wiener Laboratory, American School of Classical Studies at Athens: INTRODUCTION TO BIOARCHAEOLOGY. The course is geared towards students or professionals with an interest in bioarchaeology but with no significant prior experience in human osteology. INTRODUCTION TO BIOARCHAEOLOGY COURSE, September 4-8, 2023 Deadline for applications: May 8, 2023 The Malcolm H. Wiener Laboratory for Archaeological Science is offering an intensive week-long course in bioarchaeology to introduce participants to the analysis of human skeletal remains from archaeological contexts. Dr. Ioanna Moutafi, Post-Doctoral Fellow of the Wiener Laboratory and expert in bioarchaeology and Aegean prehistory, will lead the course with assistance from Dr. Dimitris Michailidis, an anthropologist/paleontologist and Coordinator of the Wiener Laboratory. Human bones are a unique strand of archaeological evidence, as they provide a vast array of both biological and cultural information about life and death in the past. This course will offer both the theoretical and basic technical skills for the analysis and interpretation of human remains, through lectures, seminars and interactive hands-on practical sessions. The objective is to familiarize participants with all aspects of the human skeleton and the different insights they can offer us into the past.

The course will explore key themes in bioarchaeology, such as:
• Human skeletal anatomy – bone identification
• Estimation of sex and age-at-death
• Skeletal variation
• Dealing with commingled human remains
• Paleopathology
• Nutrition and diet
• Current biomolecular advances (a-DNA, stable isotopes)
• Bones in context: social bioarchaeology and funerary archaeology

A maximum of 12 participants will be accepted for the course. Preference is given to graduate and advanced undergraduate students with an interest in archaeological science, bioarchaeology, and funerary archaeology. The course is also ideal for professional archaeologists or museum curators who may occasionally need to work with human remains. This course is not geared toward people with significant experience in human osteology or bioarchaeology. No prior experience in human osteology is required. Training fee is 450 euros for the entire course. Accommodation is not provided, but we will offer recommendations and assistance to course participants in order to arrange accommodation themselves.

The course will take place from September 4 to September 8, 2023. Applications will be submitted no later than May 8, 2023 via the online application form: American School of Classical Studies at Athens Application Manager - Introduction to Bioarchaeology Course Application (submittable.com) Applications will include a brief cover letter outlining the candidate's background and interest in participating in the course, a CV, and names and email addresses of two referees. Referees might be contacted for references after the application deadline, if necessary. Participants who successfully complete the course of instruction will receive a certificate detailing the content of the course.

For further information or questions, please contact Dr. Ioanna Moutafi (imoutafi@yahoo.gr).

Please see attached call and flyer, and share as you see fit. Apologies for cross-posting.

All best wishes,

Ioanna

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Dr Ioanna Moutafi
Bioarchaeologist
The Malcolm H. Wiener Laboratory for Archaeological Science
Postdoctoral Fellow
American School of Classical Studies at Athens
e-mail: imoutafi@yahoo.gr
tel: +30 6977716943
Dr Ioanna Moutafi

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ΧΡΙΣΤΙΑΝΙΚΗ ΑΡΧΑΙΟΛΟΓΙΚΗ ΕΤΑΙΡΕΙΑ / CHRISTIAN ARCHAEOLOGICAL SOCIETY, SCIENTIFIC SOCIETY FOR THE STUDY OF BYZANTINE AND POST - BYZANTINE ARCHAEOLOGY AND ART, FOUNDED IN 1884, CALL FOR PAPERS, DELTION OF THE CHRISTIAN ARCHAEOLOGICAL SOCIETY (DCHAE) 45 (2024)

The *Deltion of the Christian Archaeological Society* has been indexed in Clarivate Analytics and in ERIH PLUS

Deadline for submissions: Tuesday, May 30, 2023

The Board of the Christian Archaeological Society (XAE/ChAE) has decided to proceed with the preparation of volume 45 of the *Deltion of the Christian Archaeological Society* [*Δελτίον της Χριστιανικής Αρχαιολογικής Εταιρείας*] (2024), in hopes that appropriate funding sources will be found for timely printing.

Greek and foreign archaeologists and historians of Early Christian, Byzantine and Post-Byzantine art and architecture (300-1830) are invited to contribute to the volume with original papers. In accordance with the editorial guidelines, each paper intended for publication will be submitted for approval by two anonymous reviewers designated by the Society's Board.

Papers submitted for consideration should be prepared in accordance with the ***Guidelines for Authors***:
http://ejournals.epublishing.ekt.gr/index.php/deltion/about/submissions#authorGuidelines

The submitted file must include in the following order **(a)** the title of the paper, **(b)** an abstract of max. 80 words, **(c)** at least four keywords, indicating the *period*, the *general* and *specific subject* and finally the *site* and the *monument*, encompassed by the paper, **(d)** the text with footnotes, **(e)** a summary of ca. 1,000 words, **(f)** the list of the Figures with subtitles and their provenance/copyrights, and **(g)** at the end of the file, the illustrations in law resolution must be included (one figure in each page). In case that the language of the paper is other than the English, all the above information (a, b, c) must be also in English.

All papers should be submitted in **a single file**, Pdf and Word, avoiding any mention of the author's name and affiliation and any acknowledgements in the footnotes. Submissions must be placed in the electronic platform of the *Deltion of the Christian Archaeological Society*:
https://ejournals.epublishing.ekt.gr/index.php/deltion/about/submissions#onlineSubmissions

Once the paper has been accepted for publication, the final text must be submitted in the electronic platform of the *Deltion* together with the author's name and affiliation, the acknowledgments and the illustrations as high-resolution digital file (at least 300 dpi).

Due to the implementation of the electronic version of the *Deltion of the ChAE*, and in accordance with established international practice, authors of papers accepted for publication are kindly requested to provide the necessary licences for the study and the publication of the archaeological material and also to sign an Agreement with the Christian Archaeological Society, in which copyright matters are clarified.

Writers that are not already subscribed in the electronic platform of the *Deltion of the ChAE* should be subscribed following the instructions in the link below:
https://ejournals.epublishing.ekt.gr/index.php/deltion/user/register

On behalf of the Board of the Christian Archaeological Society,

The President The General Secretary

Dr Ioanna Bitha, RCBP-BA|AA
Assistant Prof. Georgios Pallis, NKUA

****

c/o Byzantine and Christian Museum, Vass. Sophias 22, GR-106 75 ATHENS, tel. +30 213 213 9556
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https://independent.academia.edu/ΧριστιανικήΑρχαιολογικήΕταιρεία/ChristianArchaeologicalSociety
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http://ebooks.epublishing.ekt.gr/index.php/chae
http://eproceedings.epublishing.ekt.gr/index.php/chae

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MINERALS SPECIAL ISSUE "GEOARCHAEOLOGY AND ARCHAEOMETALLURGY OF NATIVE COPPER

Greetings,

If you are involved with research on the archaeology of native copper please consider contributing to this special issue of Minerals.

https://www.mdpi.com/journal/minerals/special_issues/H2H45Y1W66

Naturally occurring pure (native) copper was the first metal used by humans. Native copper metallurgy began several thousand years ago but experienced multiple instances of innovation around the world. In some contexts, its use resulted in, or was related to, other kinds of metallurgical activity, such as the development of melting and smelting technologies. In other contexts, the use of native copper was the only form that metallurgy took, though its use might wax and wane over time along with other technological and social changes. This Special Issue will focus on the use of native copper cross-culturally, i.e., how it was mined or otherwise acquired, worked, traded, and used, and how it fit into different worldviews and value systems.

Manuscript Submission Information:
Manuscripts should be submitted online at www.mdpi.com by registering and logging in to this website. Once you are registered, click here to go to the submission form. Manuscripts can be submitted until the deadline. All submissions that pass pre-check are peer-reviewed. Accepted papers will be published continuously in the journal (as soon as accepted) and will be listed together on the special issue website. Research articles, review articles as well as short communications are invited. For planned papers, a title and short abstract (about 100 words) can be sent to the Editorial Office for announcement on this website.

Submitted manuscripts should not have been published previously, nor be under consideration for publication elsewhere (except conference proceedings papers). All manuscripts are thoroughly refereed through a single-blind peer-review process. A guide for authors and other relevant information for submission of manuscripts is available on the Instructions for Authors page. Minerals is an international peer-reviewed open access monthly journal published by MDPI.

Please visit the Instructions for Authors page before submitting a manuscript. The Article Processing Charge (APC) for publication in this open access journal is 2000 CHF (Swiss Francs). Submitted papers should be well formatted and use good English. Authors may use MDPI's English editing service prior to publication or during author revisions.

Keywords
native copper

archaeology
innovation
ancient mining and metallurgy
archaeometallurgy
geoarchaeology
annealing
science and technology studies
anthropology of technology

Cheers,

Dr. H. Kory Cooper
Department of Anthropology, Purdue University, West Lafayette, IN 47907, USA
Interests: innovation and culture change; behavioral archaeology; hunter-gatherers; social complexity; archaeometallurgy; geoarchaeology; e-waste &
Dr. Michelle Rae Bebber Department of Anthropology, Kent State University, Kent, OH 44242, USA
Interests: experimental archaeology; cultural evolution; human behavior; archaeometallurgy; ceramic analysis

(Special Issue Guest Editors)

FITCH LABORATORY BURSARY AWARDS 2023-2024

Applications are invited from graduate students or young scholars for an award to support research at the Fitch Laboratory, British School at Athens (BSA) for up to 3 months in the academic year (September 2023-July 2024) in any of the fields in which the Laboratory is active (e.g. ceramic studies, archaeometallurgy, geophysical prospection, zooarchaeology, archaeobotany, soil micromorphology, ethnoarchaeology, landscape archaeology, archaeology of technology; normally in the context of Aegean/Mediterranean archaeology). The Bursary includes a monthly stipend (400€), BSA membership and accommodation at the BSA Hostel in Athens and, if required for research purposes, also in Knossos. The award holder will be required to submit a report on her/his research at the Laboratory to the Laboratory's Subcommittee and Director.

The successful applicant will be expected to use the facilities of the Fitch Laboratory (including analytical equipment and reference collections) as well as the BSA library to further on-going work, in the context of a postgraduate degree or postdoctoral research. No bench fee charges will be applied but the bursary holder will need to cover the expenses of any planned sample preparation or analysis. The award carries no other formal obligation, although involvement in the academic life of the BSA (for example in the form of a seminar) is welcome.

Applications should include a covering letter (indicating the preferred length and period of stay), a Curriculum Vitae, a statement of the proposed programme of research and a title (up to one page) and the names and contact details of two referees. *Applicants should ask referees to send their recommendations by the deadline*. The successful applicant will be responsible for acquiring on time any required permits for study and transfer of archaeological material to the Fitch Laboratory. If the use of in-house analytical facilities is necessary for the proposed research, applicants are advised to contact the Laboratory Director to get feedback on analytical costs and timing; the latter mainly in relation to the WD-XRF analysis.

Potential applicants may contact Dr Evangelia Kiriatzi, the Laboratory Director (e.kiriatzi@bsa.ac.uk), for further information. Additional details about the School and the Laboratory can be found at https://nam10.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.bsa.ac.uk%2F&data=05%7C01%7Caegeanet%40lists.ku.edu%7C03dbc2e2fd064aea36cb08db0395b513%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638107713752050041%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=vu7im2q2qNVkD8nUQBIf%2Bt4q1SbzuJvz72MutLizasc%3D&reserved=0.

If you are interested in applying for an award, please check our website on how to apply (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.bsa.ac.uk%2Fawards%2Fbursaries%2Ffitch-bursaries%2F&data=05%7C01%7Caegeanet%40lists.ku.edu%7C03dbc2e2fd064aea36cb08db0395b513%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638107713752050041%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2lu

MzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=T4xNOsBqZ8U5%2FQowyyao0kFbFIO6ncUHQDn9RjHT1m8%3D&reserved=0).
Applications should be submitted by 12th May 2023.

INTERNET SITES

DECODING OLDEST KNOWN SENTENCE WRITTEN IN FIRST ALPHABET

In a landmark discovery, a team of Israeli archaeologists have decoded the oldest known sentence in the ancient language of Canaanites. The inscription found on an ivory comb unearthed in Tel Lachish, the second most important city in the Biblical Kingdom of Judah, provides evidence for the use of the alphabet some 3,700 years ago.

Video by: Pedro Films, Tree House Productions
Executive Producer: Camelia Sadeghzadeh

Please visit the site: https://www.bbc.com/reel/video/p0f3svrh/decoding-oldest-known-sentence-written-in-first-alphabet

EIKONOLOGION

The EIKONOLOGION constitutes the Digital Archives of the Natural and Cultural Heritage of Cyprus. This pionneering project has been realised thanks to a generous grant by TOTAL E&P CYPRUS. The initial collection of more than 38.000 documents donated by the founder of the Centre of Cultural Heritage, Dr. Sophocles Sophocleous, has been digitised and it is since 2017 available to the international academic community, as well as to the wide public. The EIKONOLOGION contains at this very moment more than 50.000 photographic documents classified in 34 categories.

EIKONOLOGION, by its nature and use, will always be a scientific research project under development and re-adapted according to the evolution of technology. As a platform, EIKONOLOGION is an instrument for research, where, collaborators from the international academic community can upload their photographic archives and keep the copyright for them, after getting permission from the Centre of Cultural Heritage.

FOR ORDERS PLEASE SEND AN EMAIL TO contact@heritage.org.cy

Please visit the site: http://heritage.org.cy/EIKONOLOGION-CATEGORIES

"THE NEW FRAGMENTS FROM HIPPARCHUS' STAR CATALOG AND THE MATHEMATIZATION OF THE ANCIENT ASTRAL SCIENCES", BY VICTOR GYSEMBERGH

The project "ZODIAC - Ancient Astral Science in Transformation" (Berlin) has published a new blog entry:

"The new fragments from Hipparchus' star catalog and the mathematization of the ancient astral sciences" by Victor Gysembergh (Léon Robin Research Center on Ancient Thought, CNRS)

The discovery of fragments from Hipparchus' star catalog sheds new light on a major development of positional astronomy. Hipparchus of Nicaea was a Greek astronomer active in the Eastern Mediterranean (likely in Rhodes and Nicaea) in the second century BCE. Based on ancient reports, he has long been thought to have composed the first catalog of stars to include precise numerical coordinates, representing a major step towards the mathematization of the ancient astral sciences as compared to previous qualitative descriptions of stellar positions.

In Volume 53, Issue 4 of the Journal for the History of Astronomy,Peter Williams of Tyndale House, Emanuel Zingg of Sorbonne Université and I have published new fragments of that catalogue from a palimpsest manuscript known as the Codex Climaci rescriptus. This was made possible by multispectral imaging of the palimpsest, performed by a team from the Early Manuscripts Electronic Library, the Lazarus Project of the University of Rochester, and the Rochester Institute of Technology.

Please visit the site: https://blogs.fu-berlin.de/zodiacblog/2023/02/09/the-new-fragments-from-hipparchus-star-catalog-and-the-mathematization-of-the-ancient-astral-sciences/

PODCAST: A MEDITERRANEAN METAL MYSTERY, OR, UZBEK TIN INGOTS ON THE MOVE

A new episode of our podcast, This Week in the Ancient Near East, is now available:
A Mediterranean Metal Mystery, or, Uzbek Tin Ingots on the Move

Central Asian tin in a Late Bronze Age shipwreck at the bottom of Mediterranean raises questions like, "who brought the tin thousands of kilometers west from what's now Uzbekistan," and "who's tin was it when the boat sank." Ok, they're not questions like, "what is best in life" or "are you going to eat that sandwich" but they're what we've got.

Listen at: https://thisweekintheancientneareast.podbean.com/

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

FRACTAL ALGORITHMS AND RGB IMAGE PROCESSING IN SCRIBAL AND INK IDENTIFICATION ON AN 1819 SECRET INITIATION MANUSCRIPT TO THE "PHILIKE HETAEREIA"

Ion Andronache, Ioannis Liritzis & Herbert F. Jelinek

Nature (Scientific Reports), (2023) 13:1735
https://doi.org/10.1038/s41598-023-28005-4

ABSTRACT

Historical texts incorporate important characteristics that need to be assessed including genre, text structure and content. Often overlooked are characteristics of handwritten manuscripts commonly divided into legibility, readability and aesthetics. To determine the scientific feasibility of classification of handwritten texts an objective approach is developed to describe twenty handwritten pages of an 1819 Greek manuscript, that refers to the initiation to the Greek secret "friendly society" (Philike Hetaereia) organization, established as part of the Greek independence against the Ottoman Turks.

It is investigated through a fractal and RGB image analysis approach. Fractal Minkowski Dimension was applied on the handwritten text and the RGB color analysis on the ink and paper and both were used as a non-invasive manner and revealed interesting results. The novel RGB image analysis and the fractal analysis of the manuscript identified respectively, five iron gall inks and four scribes from the ink content and handwritten styles, of the compact five lines text and whole text pages. The novel approach was verified with another old manuscript of known ink pigments, as well as with thirteen known handwritten texts of that period and four prints representing modern and similar period texts substantiating the findings of the novel methods.

GEOMAGNETIC FIELD INTENSITY VARIATIONS DURING THE SECOND MILLENNIUM BCE: NEW DATA FROM THE GREEK MIDDLE AND LATE BRONZE AGE

E. Aidona, D. Kondopoulou, E.-G. Kyriakidou, P. Camps, C. Sarafidis, G.S Polymeris, R. Orgeolet

Physics of the Earth and Planetary Interiors**,** Volume 334, January 2023, 106958

https://doi.org/10.1016/j.pepi.2022.106958

ABSTRACT

The archaeointensity records from Greece present several gaps in the prehistoric period among which the ones in the third and second millennia BCE (Early and Middle Bronze Age) are not justified by the abundance of relevant settlements in the broader Greek area. Their excavations yielded numerous collections of pottery and ceramics, well-studied to a big extent from archaeological and archaeometric point of view. We collected six groups of fragments dated from 2200 BCE to 1500 BCE which were subjected to a classical archaeomagnetic study. The material response to the experiments was mostly satisfactory, and the archaeointensity was calculated both with Thellier-Thellier and multispecimen protocols. These results, complemented by the ones recently published for the period 1500- 900 BCE, and plotted versus the existing secular variation curves for Greece and relevant geomagnetic field models document a slight intensity maximum around 1900 BCE.

Please visit the site:
https://www.sciencedirect.com/science/article/pii/S0031920122001194

COOKING WITH PLANTS IN ANCIENT EUROPE AND BEYOND INTERDISCIPLINARY APPROACHES TO THE ARCHAEOLOGY OF PLANT FOODS

Edited by Soultana Maria Valamoti, Anastasia Dimoula & Maria Ntinou | 2022

Paperback ISBN: 9789464270334 | Hardback ISBN: 9789464270341 |
Imprint: Sidestone Press Academics | Format: 210x280mm | 530 pp. | Language: English | 29 illus. (bw) | 207 illus. (fc) | Keywords: ancient cuisine; archaeobotany; petrographic analysis; usewear analysis; food remains; cooking facilities; prehistory; edible plants; modern landraces; experimental archaeology; ethnoarchaeology |

Abstract

Plants have constituted the basis of human subsistence. This volume focuses on plant food ingredients that were consumed by the members of past societies and on the ways these ingredients were transformed into food. The thirty chapters of this book unfold the story of culinary transformation of cereals, pulses as well as of a wide range of wild and cultivated edible plants.

Regional syntheses provide insights on plant species choices and changes over time and fragments of recipes locked inside amorphous charred masses. Grinding equipment, cooking installations and cooking pots are used to reveal the ancient cooking steps in order to pull together the pieces of a culinary puzzle of the past. From the big picture of spatiotemporal patterns and changes to the micro-imaging of usewear on grinding tool surfaces, the book attempts for the first time a comprehensive and systematic approach to ancient plant food culinary transformation.

Focusing mainly on Europe and the Mediterranean world in prehistory, the book expands to other regions such as South Asia and Latin America and covers a time span from the Palaeolithic to the historic periods. Several of the contributions stem from original research conducted in the context of ERC project PlantCult: Investigating the Plant Food Cultures of Ancient Europe. The book's exploration into ancient cuisines culminates with an investigation of the significance of ethnoarchaeology towards a better understanding of past foodways as well as of the impact of archaeology in shaping modern culinary and consumer trends.

The book will be of interest to archaeologists, food historians, agronomists, botanists as well as the wider public with an interest in ancient cooking.

Please visit the site: https://www.sidestone.com/books/cooking-with-plants-in-ancient-europe-and-beyond (Download the pdf for free)

LABOURING WITH LARGE STONES: A STUDY INTO THE INVESTMENT AND IMPACT OF CONSTRUCTION PROJECTS ON MYCENAEAN COMMUNITIES IN LATE BRONZE AGE GREECE, BY YANNICK BOSWINKEL

Leiden: Sidestone Press, 2021.
Pp. 220. ISBN 9789464280098

Review by
Nicholas Blackwell, Indiana University. niblackw@indiana.edu

This book represents Yannick Boswinkel's Ph.D. dissertation (Leiden University) that emerged from the SETinSTONE project, which investigated human and environmental resources related to monumental architecture in Mycenaean Greece. Boswinkel's study focuses on the labor investment required for building Cyclopean fortifications and the impact of such work on Late Bronze Age communities. Studies of Aegean architectural energetics have addressed mortuary construction (e.g., for a chamber tomb or tholos) more frequently than fortifications, so this book is a welcome addition. The monograph considers a straightforward question: did massive fortification projects on the mainland overextend local labor and material resources, hindering the Mycenaean economy and contributing to the palatial collapse? In other words, how costly were Mycenaean fortifications—in terms of labor—and how did local people respond to the demands of monumental construction? Boswinkel tackles this issue by calculating the labor investment, in person hours, necessary to build Cyclopean fortifications at two Peloponnesian sites: Mycenae in the Argolid and Teichos Dymaion in Achaea. Subsequently, he contextualizes these costs by considering each site's local resources and estimated population. Moreover, an invaluable aspect of the study is its detailed coverage of construction stages—from quarrying to transport to final assembly.

The book consists of seven body chapters, an introduction, a conclusion, and six appendices. As expected with a dissertation, a thorough literature review forms the first three body chapters on aspects of Mycenaean society, including the political economy, the collapse, Cyclopean fortifications, population estimates, and a topographical overview of Mycenae and Teichos Dymaion. Boswinkel's fortification discussion (ch. 3) stands out for his careful treatment of monumentality and the various work phases of quarrying, splitting rocks, transporting material—with consideration of friction, sleds, wheeled transport, and traction—and erecting a Cyclopean wall. The latter endeavor included laying a foundation, building a ramp, positioning blocks within exterior or interior faces, and filling an internal core. Finally, four body chapters (ch. 5–8) represent the monograph's main contribution to the study of Mycenaean architecture: a method for assessing the energetics of Cyclopean walls; the volumetric data of fortification blocks; estimated construction costs at Mycenae and Teichos Dymaion; and the implications of such data through comparative analyses.

The first step in assessing labor investment is knowing the individual block sizes within a wall. The author's fieldwork at Mycenae and Teichos Dyamion (e.g., photogrammetry and use of a total station to measure blocks) enabled him to create textured and measurable 3D models of wall sections. Boswinkel examined Mycenae's Lion Gate, North Gate, a portion of the West Wall, and a Northeast extension section, while the work at Teichos Dymaion included the Middle Gate, South Wall, Northeast section, and North Gate. This quantitative research brought to light new details about Mycenaean fortifications. Cyclopean masonry consists of a broader range of block sizes than previously recognized. There are, for instance, four distinct stone sizes (based on surface areas) as part of Mycenae's western fortification wall. The blocks are also smaller than the traditionally reported dimensions of such masonry. Boswinkel's analysis thus illustrates the quantitative power of 3D modeling and measurement while providing a more nuanced view of Cyclopean construction. The work also showed that the interior sides of fortification walls typically employed smaller blocks than those in outer sections. This detail reflects a deliberate construction choice at both sites by masons who prioritized greater monumentality—and perhaps aesthetics—in visible, exterior-facing walls.

Volume is a critical measurement in labor studies since one can express work rates in cubic meters per person hours. However, volumetric data of individual blocks are less straightforward than calculations of surface area since block depths are normally unknown in standing walls. Boswinkel thus considered eight scenarios for reconstructing volume to account for this issue. While comprehensive in reviewing different possibilities, this approach generated copious amounts of data that may confuse readers. Moreover, in his calculation of labor costs, the author presents a range of published and hypothesized work rates for quarrying, transporting, and dressing stone in addition to ramp construction. The diverse work rates from each construction stage result in substantial gaps between the estimated minimum and maximum costs. Nevertheless, the general reader will find the discussion of each phase enlightening. The author addresses the practicalities and logistics of material acquisition and quarrying, transportation of large stones, loading and unloading blocks, modifying bedrock, dressing stone, building a ramp, and constructing a wall. Of these subphases, acquisition, dressing (when relevant), and assembly are the most labor intensive.

Several labor calculations stand out. Boswinkel estimates that draft animals dragged stone loads over 10,000 kg on a sled rather than via wagon. He calculates that transporting the Lion Gate components (threshold, lintel, posts, and relief) would require as many as 166 oxen, thereby emphasizing the spectacle of the monumental construction. The total person hours of constructing the Lion Gate's threshold, lintel, and door jambs (including all of the work phases) is more than 4.5 times greater than the labor cost of the exterior conglomerate façade flanking the entryway. However, the conglomerate gateways proved less expensive than other Cyclopean-wall sections at the site due to differences in overall length. As a building style, the conglomerate facades with ashlar-like blocks were more expensive per cubic meter than the typical Cyclopean walls because masons needed to shape and roughly dress the conglomerate blocks into pseudo-ashlars.[1]

Readers will be intrigued by Boswinkel's estimate for the duration of the building projects and the presumed workforce. There are many uncertainties, including the length

of a workday (Boswinkel's range, based on comparative scholarship, is 5 to 10 hours), the number of viable work days in a year (220 to 290), and the quantity of laborers (200 to 500). Boswinkel calculates that workers could have finished the Lion Gate and North Gate in weeks, while each Cyclopean wall section analyzed could have taken half a year to two and a half years to complete. A comparable time estimate—half a year up to three years—emerges for each of the four Cyclopean wall sections at Teichos Dymaion. The breadth of possibilities in these labor calculations might lead to doubts about the value of such work. For instance, the proposed days to construct Mycenae's West Wall varies from 126 (based on a 10-hour work day with 500 people) to 629 (based on a 5-hour work day with 200 people). Boswinkel acknowledges this broad range and emphasizes that the strength of an energetics study is its comparative potential.

To contextualize the fortification investments, Boswinkel evaluated the building costs of Late Helladic III domestic structures at Mycenae and Kalamianos—relying on published data—and the labor needs of diverse building styles. Due to their scale, fortifications represent a massive investment, substantially more than any domestic structure. He notes, however, that the Cyclopean style, as judged by the cost per cubic meter, was equally as labor intensive as the stone materials in a typical house. The more significant labor investment for a fortification wall is due to a project's overall scale instead of a particular masonry style.

Comparing labor costs with population estimates is also informative, despite questions about a workforce's percentage of a given population. Boswinkel's labor and population comparisons hint at different scenarios for Mycenae and Teichos Dymaion. While Mycenae's estimated population seems capable of providing the necessary labor for its fortifications, the data for Teichos Dymaion suggest that local resources were insufficient. Population estimates for Teichos Dymaion are relatively low in comparison to the labor demands of its fortification walls. That site's construction thus required participation by most of its local people or mobile laborers from elsewhere. Its Cyclopean walls likely reflect a regional or trans-regional project rather than a local one, taking two to three years to complete based on the low population estimates for the site and Achaea. On the other hand, Mycenae's population could have handled its expanded fortification if there had been 200 workers. Boswinkel notes that 500 laborers would have stressed the population, perhaps hinting at a regional endeavor that relied on labor from beyond Mycenae's immediate environs. The Argolid's rural population remains unclear, but Mycenae may have used short-term regional workers for its more extensive projects.

The Mycenae calculations signal that Cyclopean fortifications did not overextend the local economy or population to the point of contributing to the state's collapse. The evidence from Teichos Dymaion suggests that labor investment there may have overwhelmed a relatively small community. However, a regional project relying on short-term and shared labor from elsewhere may explain the construction of that site's fortifications. The labor investment at both sites was substantial but not so much that the projects fatally undercut the palatial economy. Readers may wonder about the comparative labor costs between Mycenae's walls and other citadels in the Argolid, especially Tiryns and Midea. That question relates to the broader SETinSTONE project and is beyond the scope of Boswinkel's study. His focus on two case studies in distinct areas of the northern Peloponnese provides a fascinating architectural and labor comparison.

The author's fieldwork, architectural autopsy, and digital models of Mycenae and Teichos Dymaion's fortifications add to our understanding of Cyclopean masonry and wall construction, despite uncertainties about volumetric data for individual blocks. The author's detailed discussion of Cyclopean construction phases illustrates well the labor needs and costs of monumental Mycenaean architecture. Investment studies of prehistoric architecture require hypothetical scenarios for specific labor calculations, and the author is meticulous in pondering a series of variables. As such, data occur in 40 tables summarizing many calculations—in addition to 33 pages of appendices that list analyses of block volumes and rates of quarrying, transportation, and wall assembly. The monograph, however, is much more than a list of data; it effectively demonstrates the value of researching architectural energetics. Moreover, these labor cost calculations will help anyone exploring the practical details of monumental construction. The volume includes color photographs, helpful maps, and images taken from photogrammetric models. In particular, the portrayal of Cyclopean wall sections, color-coded by block size (e.g., Figs. 5.8, 6.1), is revealing. These figures are compelling for showing overlooked masonry details and demonstrating the value of 3D data in current and future scholarship. The author deserves praise for publishing his dissertation immediately as a polished monograph, in which there were very few typographical errors.

The book will appeal to students and scholars interested in the logistics of different architectural stages, including the transport and placement of stone material; the energetics of building with large stones; and the potential impact of such labor on the Mycenaean economy. It is a critical contribution to the study of Mycenaean architecture, Cyclopean fortifications, and related building costs. In addition, despite its technical focus, the book contributes to a broader discussion about the palatial collapse of Mycenaean society. In sum, the book represents a valuable contribution to the study of Aegean Prehistory.

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Notes

[1] For further discussion about ashlar and pseudo-ashlar masonry, readers should consult an up-to-date volume that appeared just before Boswinkel's book: Devolder, M. and I. Kreimerman, eds. 2020. Ashlar: Exploring the Materiality of Cut-Stone Masonry in the Eastern Mediterranean Bronze Age. Aegis 17, Louvain-la-Neuve: Presses universitaires de Louvain.

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Please visit the site: https://bmcr.brynmawr.edu/2023/2023.01.42/

CRANIAL TREPHINATION AND THE EARLIEST POSSIBLE CASE OF LEPROSY IN THE EASTERN MEDITERRANEAN: THE EVIDENCE FROM TWO ELITE BROTHERS FROM LATE BRONZE MEGIDDO, ISRAEL

R. Kalisher, M.S. Cradic, M.J. Adams, M.A.S. Martin and I. Finkelstein

Plos One February 22, 2023

Abstract

Here we present the paleopathological profiles of two young adult males, identified as brothers through ancient DNA analysis, who were buried together beneath the floor of an elite early Late Bronze Age I (ca. 1550–1450 BC) domestic structure at the urban center of Megiddo (modern Israel). Both individuals displayed uncommon morphological variants related to developmental conditions, and each exhibited extensive bone remodeling consistent with chronic infectious disease. Additionally, one brother had a healed fracture of the nose, as well as a large square piece of bone cut from the frontal bone (cranial trephination).

We consider the potential etiologies for the appearance of the skeletal anomalies and lesions. Based on the bioarchaeological context, we propose that a shared epigenetic landscape predisposed the brothers to acquiring an infectious disease and their elite status privileged them enough to endure it. We then contextualize these potential illnesses and disorders with the trephination procedure. The infrequency of trephination in the region indicates that only selected individuals could access such a procedure, and the severity of the pathological lesions suggests the procedure was possibly intended as curative to deteriorating health. Ultimately, both brothers were buried with the same rites as others in their community, thus demonstrating their continued integration in society even after death

Please visit the site:
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0281020 is this article

A CONTRIBUTION TO THE STUDY OF COPPER PRODUCTION IN THE IRON AGE POLITY OF PAPHOS IN CYPRUS

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Abstract

This paper presents the results of the chemical, microscopic and isotopic analysis of an archaeometallurgical assemblage consisting of slag and metal samples from two Cypro-Classical monuments recently located within the urban landscape of the polity of Paphos, and from two slag heaps in the metalliferous region of the Paphos hinterland. The project identified technological changes and innovations, such as the introduction of new types of fluxes and the optimization of the smelting technology. Furthermore, the analysis of slag samples from one of the two monuments, identified as workshop complex on the plateau of the Paphian citadel, revealed the presence of an iron smithy. This pioneering interdisciplinary study paves the way for the development of a comparative archaeo-metallurgical project that will define the fingerprint of the Paphos copper deposits. The study was carried out in the context of the University of Cyprus-Leventis Foundation Project, "From the metalliferous sources to the citadel complex of ancient Paphos: Archaeo-environmental analysis of the mining and the built environment" (acronym MEANING 2017–2019).

Please visit the site:
https://www.sciencedirect.com/science/article/abs/pii/S2352409X23000305?via%3Dihub

ΕΙΔΗΣΕΙΣ - NEWS RELEASE

ARCHAEOLOGISTS FIND 5,000-YEAR-OLD TAVERN -- INCLUDING FOOD REMAINS, BY ISSY RONALD

Eating out seems to have been as popular 5,000 years ago as it is today, with archaeologists in Iraq uncovering an ancient tavern dating back to 2,700 BCE.

Researchers working in the ancient city of Lagash discovered that the pub, hidden just 19 inches below the surface, was split into an open-air dining area and a room containing benches, an oven, ancient food remains and even a 5,000-year-old fridge.

They initially found themselves in the open courtyard space, an area that was difficult to excavate, being "open and exposed to the outdoors," Reed Goodman, an archaeologist from the University of Pennsylvania, told CNN.

After returning to the mysterious courtyard a few months later, in fall 2022, field director Sara Pizzimenti, from the University of Pisa, broadened the trench.

The team then discovered the industrial-sized oven, a moisture-wicking ancient "fridge," to keep food cool, and dozens of conical bowls, many containing fish remains, revealing the purpose of the courtyard to be an outdoor dining area.

"I think the first feature to show itself was this very large oven and it's actually beautiful," Goodman said. "From various burning episodes and deposits of ash it left a sort of rainbow coloration in the soils and the interior is framed by these big bricks."

Lagash, now the town of al-Hiba, was one of the oldest and largest cities in southern Mesopotamia -- occupied from the fifth millennium until the middle of the second millennium BCE and encompassing an area of almost two square miles.

It has since become an important archaeological site, with excavations restarting most recently in 2019 as part of a joint project between the Penn Museum, the University of Cambridge and the State Board of Antiquities and Heritage in Baghdad, using new techniques such as drone photography and genetic analysis.

Using state-of-the-art technology, the archaeologists are able to "see" underground and only excavate when necessary. Credit: Lagash Archaeological Project

Previous excavations focused on religious architecture and understanding the elites, but Holly Pittman -- director of the Lagash Archaeological Project and curator of the Penn Museum's Near East section -- concentrated on non-elite areas during these latest excavations to provide a broader understanding of ancient cities.

Uncovering a tavern supports the perspective of Pittman and her team that society was not organized into just elites and enslaved people -- the previous prevailing view -- but included an ancient middle class.

"The fact that you have a public gathering place where people can sit down and have a pint and have their fish stew, they're not laboring under the tyranny of kings," Goodman said.

"Right there, there is already something that is giving us a much more colorful history of the city."

Please visit the site: https://www.cnn.com/style/article/5000-year-old-tavern-iraq-archaeology-intl-scli-scn [Go there for pix]

ANCIENT CASTLE USED BY ROMANS AND BYZANTINES DESTROYED IN TURKEY EARTHQUAKE, BY LILIT MARCUS

The earthquake that struck Turkey and Syria on Monday has badly damaged Gaziantep Castle, a historic site and tourist attraction in southeastern Turkey.

The castle collapsed during the 7.8 magnitude earthquake that struck in the early hours of February 6.

“Some of the bastions in the east, south and southeast parts of the historical Gaziantep Castle in the central Şahinbey district were destroyed by the earthquake, the debris was scattered on the road,” Turkish state-run news agency Anadolu reported.

“The iron railings around the castle were scattered on the surrounding sidewalks. The retaining wall next to the castle also collapsed. In some bastions, large cracks were observed,” the report said.

The dome and eastern wall of the historical Şirvani Mosque, which is located next to the castle and is said to have been built in the 17th century, also partially collapsed, it added.

According to archaeological excavations, the castle was first built as a watchtower in the Roman period in the second and third centuries C.E. and expanded over time.

It took its current form during the reign of Byzantine Emperor Justinian (527-565 C.E.), according to Turkish Museums, the official site of museums and archaeological sites in the country.

Most recently, it served as the Gaziantep Defense and Heroism Panoramic Museum.

So far, there have been more than 18 recorded aftershocks measuring 4 or higher on the Richter scale since the initial tremor, one of the strongest to hit Turkey in a century.

More than 600 people have been killed throughout the affected areas of Turkey and Syria.

According to Turkey’s Vice President Fuat Oktay, some 1,700 buildings were damaged across 10 Turkish cities.

Please visit the site: https://www.cnn.com/travel/article/gaziantep-castle-destroyed-turkey-earthquake/index.html [Go there for pix]

BATTLE SITE OF 'GREAT REVOLT' RECORDED ON ROSETTA STONE UNEARTHED IN EGYPT, BY JENNIFER NALEWICKI

A battleground fought over by ancient Egyptians and the Ptolemaic Kingdom and mentioned on the Rosetta Stone has been discovered.

Archaeologists have long known about the Great Revolt, a battle between the ancient Egyptians and the Ptolemaic Kingdom that lasted from 207 B.C. to 184 B.C., because it is mentioned on the Rosetta Stone and in other historical texts. But now, archaeologists have finally discovered the exact location of one of the revolt's battles.

In 2009, archaeologists began excavating a site known as Tell el-Timai, where an ancient Greco-Roman industrial city called Thmouis was located on the Nile Delta of northern Egypt. The excavations were part of the Tell Timai Archaeological Project(opens in new tab), an ongoing program by the University of Hawaii to learn more about Thmouis and the role it played in ancient Egypt. The team's findings were published Dec. 27, 2022 in the Journal of Field Archaeology(opens in new tab).

The excavations revealed evidence that Thmouis was "ground zero" of a violent conflict, but at first the researchers weren't certain which one.

Over the next decade, they unearthed the remains of numerous buildings that had been burned to the ground, as well as a cache of artifacts that included weapons like ballista stones along with coins and a headless statue depicting the Ptolemaic queen Arsinoë II. They also discovered an abundance of unburied ancient human remains strewn about the city, according to the study.

"At first I was seeing things that piqued my curiosity and began to realize that we were looking at the destruction layer," study first author Jay Silverstein(opens in new tab), project co-director of Tell Timai and an archaeologist and senior lecturer at Nottingham Trent University in the United Kingdom, told Live Science. "And then we started finding bodies."

The Ptolemaic period (304 B.C. to 30 B.C.) was started by Ptolemy I Soter, one of Alexander the Great’s Macedonian generals. The Rosetta Stone contains a decree written in 196 B.C., during the reign of pharaoh Ptolemy V, when the Great Revolt was ongoing.

Both before and after the Ptolemies gained control, ancient Egyptians were meticulous when it came to burying the dead, even creating "elaborate underground embalming workshops," like the one recently discovered in Saqqara.

"In Egypt, people pay a lot of attention to burying people, so to have people unburied tells you a lot," Silverstein said. "All these findings were sending a message that there was some event here in history and we had to figure out what it was."

However, the identities of the deceased are unclear. "The unburied dead could be Greeks who lived at Thmouis who were overtaken by the violence of the insurrection, or they could be Egyptians who died defending the town," the researchers wrote in the study.

Dating the battleground

Using some of the artifacts plucked from the site, including coins pulled from beneath a home's floorboards, along with the discovery of an abandoned kiln complex where pottery was produced, archaeologists could better pinpoint the time period of the battle based on when the coins were minted.

During the excavation, they pulled fragments of imported Greek wares and shards of pottery, whose styles helped them determine that the ceramics probably dated to the Ptolemaic Kingdom, Silverstein said.

Within the kiln complex, archaeologists were surprised to find the remains of a man inside a kiln with his legs sticking out.

"I think it's possible that he had crawled into a non-functioning kiln to try to hide [during the attack]," Silverstein said.

Historical texts also confirm that the kilns were shut down near the end of the Early Ptolemaic period, when the Egyptians unsuccessfully tried to liberate themselves from Ptolemaic rule during the Great Revolt. The kilns that remained and were unearthed during the excavation were all "truncated at a uniform level," offering more evidence that an attack happened at the site, according to the study.

"The evidence of conflict and destruction at northern Thmouis is unequivocal, and the timing is well-placed … and thus coincides with the Great Revolt," the study authors wrote in their paper.

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Jennifer Nalewicki is a Salt Lake City-based journalist whose work has been featured in The New York Times, Smithsonian Magazine, Scientific American, Popular Mechanics and more. She covers several science topics from planet Earth to paleontology and archaeology to health and culture.[...]

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Please visit the site: https://www.livescience.com/rosetta-stone-ancient-egyptian-battle-site [Go there for pix]

QUAKE DAMAGES ANCIENT ALEPPO CITADEL

Several of Syria's archaeological sites including a famed citadel in the northern city of Aleppo were damaged in a deadly pre-dawn earthquake Monday, the country's antiquities authority said.

"Parts of the Ottoman mill inside the citadel" of Aleppo have collapsed, while "sections of the northeastern defensive walls have cracked and fallen", Syria's Directorate-General of Antiquities and Museums said in a statement.

Parts of the dome of the minaret of the Ayyubid mosque inside the citadel fell off, while the entrance to the fort has been damaged, "including the entrance to the Mamluk tower", it added, publishing photos of the site on its Facebook page.

More than 850 people were killed across Syria as buildings collapsed after the 7.8 magnitude earthquake struck neighbouring Turkey, state media and rescuers said.

At least 156 people died in Aleppo province alone and 507 were injured when 46 buildings collapsed, the official news agency SANA had said, quoting an official.

The city of Aleppo is renowned for its ancient citadel, its UNESCO-listed historic centre and its centuries-old covered markets.

Aleppo was Syria's pre-war commercial hub and considered one of the world's longest continuously inhabited cities, boasting markets, mosques, caravanserais, and public baths, but a brutal siege imposed on rebels left it disfigured.

Even before the earthquake, buildings in Aleppo often collapsed due to poor infrastructure after more than a decade of war and little oversight to ensure the safety of new construction projects.

In Hama province, archaeological surveys found that "some buildings inside the ancient Al-Marqab Castle" in the city of Baniyas had been damaged, while parts of the fortifications and a tower had fallen, the antiquities body said.

In Tartus province, part of a rocky cliff fell in the vicinity of the Qadmus castle, and residential buildings on the site collapsed, it added.

Expert teams were reportedly assessing the damage, and whether the earthquake had affected the ancient city of Palmyra.

The pre-dawn quake hit near Gaziantep in southeastern Turkey at a depth of about 18 kilometres (11 miles), the US Geological Survey said.

Tremors were also felt in Lebanon and Cyprus, AFP correspondents said.

Please visit the site: https://www.france24.com/en/live-news/20230206-quake-damages-ancient-citadel-in-syria-s-aleppo

ARCHAEOLOGISTS RACE AGAINST TIME IN JERUSALEM, BY TOM TRACY

Yehiel Zelinger, a Jerusalem Region archaeologist says they have about 14 excavations running right now in the Holy City

One of Israel's leading archaeologists working on the Pilgrimage Road excavation near Jerusalem's Temple Mount said that with so much new construction underway around the Holy City the rush is on to document and preserve the past before it's too late.

"Right now in Jerusalem we have about 14 excavations running -- and we have 30,000 registered antiquity sites in all of Israel," said Yehiel Zelinger, a Jerusalem Region archaeologist for the Israel Antiquities Authority with some 30 years of experience in the field here.

"There is so much construction and development we have to catch as much as we can right now because otherwise we won't have the data," he told OSV News during an in-person conversation in January.

One of the major projects getting a lot of attention over the last decade is the discovery of what is believed to be a 2,000-year-old pilgrim walking path, or stepped street, in Jerusalem's City of David National Park area.

It connects the Pool of Siloam in east Jerusalem to the foot of the Temple Mount, at the site of the holiest site in Judaism and one of the holy places for Muslims as well. The Temple Mount with its Dome of the Rock and the nearby Al-Aqsa Mosque is considered the third holiest site in Islam.

The Pilgrimage Road excavation project is being funded by a number of private donors including some notable American tech industry and gaming industry titans and is expected to be open to the public in the coming two years.

The tunnel excavation of the Pilgrimage Road, which is now running through a tunnel underneath a number of local homes, is believed to have served as a pathway to the Temple Mount used heavily during the main pilgrimage festivals during the reign of Herod the Great.

The road therefore was likely familiar to Jesus Christ as well as the millions of Jewish pilgrims here during their ascent to the Temple.

The Pool of Siloam, which is likely hundreds of years older than the Pilgrimage Road, also is the site where the Gospel of John records Christ healing a blind man.

Zelinger said if he had his druthers he would prefer to leave any archaeological site undisturbed and for future generations who may have better scientific methods for preserving and analyzing soil and excavated artifacts.

But construction projects including that of a future parking garage nearby -- and which partially led to the discovery of the Pilgrimage Road -- means that Israel's antiquities department has had to step in to document and preserve what historic finds they can before construction can proceed.

There are currently some 80 archaeologists all over Jerusalem district at work in the area. As with any dig, some of the most revealing objects uncovered include coins, pottery, cookware and jewelry, and that has been the case at the Pilgrimage Road excavation as well.

It is believed a community market space was part of the walkway experience, while archaeologists are still speculating on the exact purpose of other structures of the excavation they have uncovered.

The street was approximately eight meters wide and its length from the Pool to the Temple Mount is 600 meters. The pathway was constructed with gutters to allow water to drain down to a well defined drainage system immediately below the stepped street.

"The main thing we are using (for understanding an excavation site) is pottery: it is the cheapest thing and from all throughout the years -- 4,000 years ago people cooked in vessels and cooking pots and 500 years ago and 200 years ago -- each cooking pot looked a little bit different," Zelinger said.

"In classical periods we also have coins to give us a clue of the phase we are dealing with.

The biggest problem in archaeology is that you can excavate a site just once, because when you are actually excavating it you ruin the site; and if you are not doing the documentation well, you lose the data," he said. "So the most important thing is the documentation and publishing the date."

Some additional 300 feet of the Pilgrimage Road remain to be excavated before tourists can visit and walk along the full length of the route, following in the footsteps of ancient pilgrims to the Holy City.

Meanwhile the nearby City of David National Park and Davidson Center Archaeological Park provide private guided tours here. Currently, academics have reportedly debated whether the Pool of Siloam was a mikveh for ritual purification before walking up the street to the Temple or simply a Roman recreational facility.

"The most important thing is to publish (findings) for the scientific community and for the public," said Zelinger, who also teaches archaeology at a local university. "It has to be built on facts and once more we are trying to work with facts -- coins, poetry, carbon footing, magnetic fields -- all those things are methods that build up the story."

That historical story also can be augmented with sacred Scripture and historical written sources but usually only after all the scientific processes have been exhausted, Zelinger added.

Names carved in stone inscriptions at classical era excavations are often cross-referenced with Biblical era names.

"It doesn't mean it's the same person, but it means the name was in use during that time or is the ancestor of someone in the Bible," Zelinger said. "These are only details but that builds up the story all together."

Please visit the site: https://www.ucanews.com/news/archaeologists-race-against-time-in-jerusalem/100480

WHAT CAN MYTHOLOGICAL NARRATIVES TELL US ABOUT MYCENAEAN LONG-DISTANCE TRADE IN THE BRONZE AGE?

BY JÖRG MULL

The Late Bronze Age (ca. 1600 to 1150 BCE) was a time of unprecedented economic activity in human history, spurred on by the supply and production of the eponymous alloy bronze on an almost industrial scale. The supply networks for copper and tin, the components of true bronze, stretched over large parts of western Eurasia and included long-distance maritime transport during this period.

The palatial centers of Mycenaean Greece were positioned at a unique geographical interface between the cultural centers of the eastern Mediterranean as well as the metal supply sources in the western Mediterranean, northern Europe, and the Black Sea area. There are archaeological, historical, and epigraphic indications that the Mycenaean Greeks somehow contributed either directly or indirectly via intermediaries to the exchange of goods in the second half of the 2nd millennium BCE:

Archaeological evidence: Mycenaean pottery has been found all around the Mediterranean basin. These finds, however impressive, do not in all cases automatically prove that the Mycenaeans brought the ceramics to these remote locations themselves. The pottery could also have been brought to the various destinations by intermediaries.

Historical and epigraphic evidence: Written documents from the Late Bronze Age that mention the Mycenaeans are still few and far between. Mycenaeans may have been occasionally mentioned in Egyptian diplomatic correspondence as Tanaju (Danaans) and in Hittite texts as Ahhiyawa (Achaeans). Inscriptions in Egypt (e.g. from Kom el-Hetan) indicate a degree of familiarity on the Egyptian side with destinations in the Aegean. Additionally, some Linear B inscriptions in Mycenaean palaces seem to mention some toponyms in the Mediterranean and the Black Sea area. The available historical and epigraphic material is subject to interpretation, often selective, and thus not able to provide a comprehensive view of Mycenaean trading and traveling activities.

Overall-and partially due to the above-mentioned limitations of archaeological and historical evidence-the degree to which the Mycenaean Greeks conducted long-distance commercial journeys themselves to participate in the metal trade of the period is still disputed. However, there is one corpus of material that has not been given enough attention in the debate: the later mythological tradition.

In my recent book, Towards the Borders of the Bronze Age and Beyond, I analyzed the large corpus of Greek myths that contains evidence of long-distance journeys of Mycenaean pioneering adventurers. Many of the myths are very likely to go back to Bronze Age roots. For instance, in the 8th century BCE, Homer extensively quotes older myths that preceded his account of the Trojan War and which may have been initially transmitted verbally over centuries (following the Oral Theory of Parry and Lord). Potential later distortions and re-interpretations of myths especially during the colonial

age of Greece sometimes make it difficult to identify the Bronze Age nuclei. Yet, we still have access to a large corpus of ancient mythological transmission by various mythographers and historiographers over the Archaic, Classical, Hellenistic, and Roman periods of Greece with a high degree of intertextuality.

The transmitted mythical stories of Mycenaean explorers on the metal trading routes of the Late Bronze Age can provide supporting evidence to answer the still-open question of direct Mycenaean involvement in the exchange of goods, especially metals, during the Late Bronze Age. In particular, the analysis of these texts with regard to the regional reach of Mycenaean exploration shows by and large a high degree of consistency with the archaeological evidence.

In the eastern Mediterranean, frequent contact between Mycenaeans and other peoples is embedded in a rich mythological heritage, with the respective older myths mostly focusing on topics of origin and descent. The transmission reveals a high degree of familiarity with the region and its inhabitants and is not consistent with a picture of Mycenaeans only relying on intermediaries for travel and trade. For example, the Bellerophon myth as a "first mover" account with respect to Anatolia coincides broadly with the beginning of Mycenaean expansion abroad. In the myth, transmitted to us by Homer, Bellerophon (son of Glaucus and grandson of Sisyphus) was sent away to Lycia in southwest Anatolia (having gotten into trouble in Corinth and Argos), where he embarks on a number of adventures, such as battling the chimaera.

Regarding contacts with Egypt, the mythological tradition of Belus and Agenor (transmitted, e.g., by Apollodorus) depicts genealogical ties between rulers of Egypt and the Levant, likely referencing the Second Intermediate period when a dynasty of Semitic origin ruled the Nile Delta. Actually, the mythical transmission indicates earlier direct visits of Mycenaeans to the Nile (from ca. 1550 BCE onwards) compared with the existing archaeological and historical record-mythological contacts predate the archaeological and historical evidence by about a century.

The mythological record for the areas in the western Mediterranean in terms of topics is different and focuses on explorations and "first movers". Geographical targets are often metal production areas in the various regions. For example, the mythological record contains references to the establishment of a metal trading colony on Sardinia, such as in the stories about Herakles and his nephew Iolaus told by Diodorus Siculus. There are also references to trips to the Iberian Peninsula by the heroes Perseus and Heracles just at the point in time when (in historical terms) the trading route on the Atlantic Ocean began to open up again (i.e. from ca. 1350 BCE onwards).

As for other regions, Italy is an interesting lacuna in terms of "first mover" or exploration myths, as archaeological evidence shows that it was relatively well-known to the Mycenaeans. In the Black Sea region, archaeological materials of Mycenaean origin are relatively scarce, although this may be due in part to the limits of modern archaeological exploration. The myth of Phrixus and Helle (children of Athamas, king of Boiotia, as told by Apollodorus) points to Mycenaean travel to the Pontic region. Based on genealogical chronology, Phrixus and Helle should be placed around 1250 BCE. Access to the Black Sea may have been a relatively late event in Mycenaean history and only possible after political and nautical obstacles were cleared.

Further destinations of metal supply, like northern Europe (Hyperborea), may even have been known to the Mycenaeans indirectly via contacts with other traders and travelers. A considerable amount of scholarly speculation regarding direct contacts between Mycenaeans and Britain via the "Atlantic route" is still not backed up by sufficient archaeological evidence.

A common thread among many of the connected myths are frequent metaphors about "flying" to remote destinations (e.g. Pegasus, the Ram of Phrixus, Daidalos' wings, Perseus' flying Sandals). These metaphors may stand in for a new type of fast-moving ship, which allowed the Mycenaeans access to faraway destinations. Based on literary and other evidence, it has been estimated that these ships, the standard size being the "pentekonter" with 50 rowers, could theoretically travel up to 200km a day in ideal conditions. An average of 50 to 80km/day for long distances seems more likely, taking into consideration crew fatigue and rest. The colorful language used in the mythological tales may help to express the wonder at the long distance of these journeys felt by a sedentary population at home.

In sum, a holistic view of Mycenaean overseas contacts that includes the mythological heritage shows clear evidence of Mycenaean long-distance travel and exploration contained within the corpus of Greek myths, with a focus towards the metal supply centers of the age in Sardinia, southern Iberia, and the Black Sea area. Combined with the archaeological evidence, this helps strengthen the case for Mycenaean long-distance trade in the Bronze Age and points to where future work should continue.

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Jörg Mull is the author of Towards the Borders of the Bronze Age and Beyond: Mycenaean Long Distance Travel and its Reflection in Myth (Sidestone Press 2022). He studied Greek and Latin and holds a Doctorate in Economics.

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Please visit the site: https://www.asor.org/anetoday/2023/02/mythological-narratives-mycenaean-trade [Go there for pix, maps & format]

CUNEIFORM MATHEMATICS: OUTSTANDING TECHNIQUES IN A SYSTEM OF TEXTS, BY CARLOS GONÇALVES

Mathematical cuneiform documents from various sites and periods provide a wealth of information about the conceptualization and practice of mathematics in ancient Mesopotamia. The corpus is especially rich for the Old Babylonian period (ca. 1900 – 1600 BCE), and from these documents we can observe a systematic approach to the transmission of mathematical knowledge and tools.

The most common evidence for mathematical knowledge in ancient Mesopotamia is given by cuneiform tablets that were used in the teaching and learning process, either in a school itself, or, as might be the case of the so-called advanced mathematics, some erudite environment connected to the schools. Another category of evidence is given by cuneiform documents that integrated professional practice: the planning of a canal, loan contracts, inventories, and land-division diagrams are documents whose effectiveness depended on skills in counting, measuring, calculating, and doing geometry. Indirect evidence also comes from material culture that reflects the application of mathematical calculations, such as buildings, irrigation networks, the fabrication of bricks, the division of work, and the distribution of food rations. To all this, we could add what became known as “eduba texts”: narratives which portray the life within the schools in Mesopotamia, especially in the Old Babylonian period, giving an important place to mathematics.

Although mathematics must have existed in Mesopotamia also as knowledge that was orally developed, transmitted, and adapted, historians unfortunately don’t have direct access to such traditions. In the best of scenarios, we may have only glimpses of mathematical orality from the traces it left in the written word, but so far no systematic research work has been done in this direction. Having said that, the historiography of cuneiform mathematics has been enormously fruitful in analyzing the surviving texts, such that countless aspects of the outstanding Mesopotamian mathematical techniques are known today.

More impressively, however, we know Mesopotamians were able to organize this amazing knowledge not in an abstract mathematical treatise as in some other mathematical traditions, but in a system of mathematical textual genres, which will be briefly sketched out in the following.

The first genre consists of multiplication tables, which were very common in Old Babylonian scribal schools, such as in this tablet in the Louvre (AO 8901):

Fig. 1: Obverse of an Old-Babylonian multiplication tablet (Louvre AO8901). Photograph by author.

A multiplication table usually consisted of the results of the multiplication of a fixed number by the factors from 1 to 20 and by 30, 40, and 50. As each multiplication table was relative to only one fixed number, students had to learn several of them, each one for

a different fixed number. The fixed number is called the "head number" in Assyriological publications. In the case of AO 8901, the head number is written in cuneiform as in Fig. 2, corresponding to the two slightly damaged initial cuneiform signs in the first line of the tablet:

Fig. 2: Reconstruction of the damaged beginning of the first line of the above tablet: a cuneiform representation of the value "7:30" (= 450 in our system).

The seven vertical wedges at the left represent seven units, while the three wedge-heads at the right (called "Winkelhaken" in Assyriological texts) represent three tens. Together, scholars annotate this as "7:30". AO 8901 shows the results of the multiplications of 7:30 by the factors 1 to 20, and by 30, 40, and 50.

Numbers in multiplication tables followed a sexagesimal system (aka base 60). We still use the sexagesimal system for counting time, so "7:30" can be roughly understood as 7:30 in a clock display, i.e. 7 units of 60, plus 30:

7:30 = 7 x 60 + 30 = 450
In other words, 7:30 in base sixty is the same as 450 in base ten.

One interesting thing is that there was no fixed order of magnitude when numbers were written in the sexagesimal system. To keep with the comparison with the clock display, it is as if 7:30 could represent 7 hours and 30 minutes or 7 minutes and 30 seconds, with context as the only criterium to help decide which option is the correct one.

When students in a scribal school had committed to memory several multiplication tables with different head numbers, they could produce a different type of text which we refer to as a composite multiplication table, because it is the result of the juxtaposition of several multiplication tables one after the other on one same writing surface. An example of this is on the clay cylinder A 7897, held in the collection of the Oriental Institute in Chicago (See Fig. 3). Its columns contain a long series of individual multiplication tables (See Fig. 4). Multiplication tables like AO 8901 and composite multiplication tables like A 7897 are different textual genres integrating the system Mesopotamians developed to organize their mathematics.

Fig. 3: Some columns of the cylinder A 7897 in the Oriental Institute (Image courtesy the Oriental Institute)

Fig. 4: Schematic drawing of cylinder A 7897, showing only the head numbers of the multiplication tables written on its surface.(Neugebauer and Sachs 1945, 25).

Another type of table is called a metrological table, because it deals with measurement values. Each of its lines associates a measurement value and a sexagesimal number. This allowed scribes to carry out various types of practical computations involving units of measure. In the example below from the Diyala region (Oriental Institute A 21948), its lengthy text related surface measurements and sexagesimal numbers.

Fig. 5: Obverse and reverse of a tablet with a metrological table (Oriental Institute A 21948). Image courtesy CDLI.

Fig. 6: Drawing of above tablet (Greengus 1979 Plate XCVIII; highlighted by author).

Its first lines use the surface measurement sar, (approximately 36 square meters) which in the Old Babylonian Period was defined as a square of sides 1 ninda (approximately 6 meters). From the analysis of the parts of the text that are not damaged and from what is known about other similar texts, the complete contents of this metrological table can be reconstructed. Here is how we can understand the first four lines:

LINES IN A 21948	POSSIBLE UNDERSTANDING
1/3 sar	20One third of the surface measurement sar is associated with 20
½ sar	30One half of a sar is associated with 30
1 sar	1One sar is associated with 1
2 sar	2Two sar is associated with 2

The first lines of A 21948 (highlighted in Figure 6) and what they mean.

Back to the analogy with a clock display, if one third of a sar is associated with 20 (think of 20 minutes), then one entire sar will be associated to 20 times 3, which is exactly 1 (for 60 minutes = 1 hour), as stated in A 21948.

Although metrological tables are a textual genre different from multiplication tables and composite multiplication tables, the concept of multiplication is present in all these types of texts. Mesopotamians went into a high degree of detail in organizing their mathematics.

A fourth type of mathematical textual genre consists of word-problems. Different from mere exercises, word-problems require skill in interpreting the given data, in order to apply mathematics and obtain what is required. A tablet in the collection of the Iraq Museum (IM 121613) contains a sequence of geometrical word-problems, or problem statements and solutions. The first word-problem of this tablet asks for the length and width of a rectangle, if it is known that:

Its width is two-thirds of its length and Its surface is six hundred sar

Fig. 7: Obverse (l) and reverse (r) of a geometric word-problem text (IM 121613. Image courtesy CDLI)

What is interesting, and this is in fact very common in Old Babylonian word-problems, is how the associations between measurement values and sexagesimal numbers are present in the solution, thus providing a connection between word-problems and metrological tables. As a concrete example, in the first problem of IM 121613, the surface of the rectangle, given as 600 sar, is also referred to as the sexagesimal number 10. In fact, six hundred sar corresponds to the sexagesimal number 10 in tables of surfaces, exemplified by the metrological tablet in figures 5 and 6 (think of 10 hours = 600 minutes).

The four genres briefly sketched out here—multiplication tables, composite multiplication tables, metrological tables and word problems—plus other types not mentioned, formed an interconnected web of textual genres that materialized

mathematical knowledge. We now know that this interconnection seems to have had regional variation. In the south of Old Babylonian Mesopotamia, around Nippur, the system worked in a rigid way, with some arithmetical operations being carried out only with sexagesimal numbers. On the other hand, practices in the Diyala region were a bit less rigid, and measurement values could be used for the same operations. Despite these slight differences in what could be called "cultures of computation", the system of textual genres remained, giving a sense of unity for the Mesopotamian mathematical knowledge.

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Please visit the site: https://www.asor.org/anetoday/2023/02/cuneiform-mathematics
[Go there for pix, drawings, and format]

SEVERE DROUGHT MAY HAVE CONTRIBUTED TO THE DECLINE OF THE HITTITES, BY WILL SULLIVAN

The empire abruptly vanished around 1200 B.C.E., and ancient tree rings suggest climate played a role Will Sullivan

From around 1650 to 1200 B.C.E., the Hittite Empire ruled over much of Anatolia in modern Turkey, as well as northern Syria. They battled Egyptians for control of Canaan, developed long-distance trade networks and farmed with advanced irrigation systems. But then, the state suddenly collapsed. Its capital city was abandoned, and its leaders may have fled the palace.

Researchers have been grasping at explanations for the empire's downfall for centuries, suggesting volcanic eruptions, earthquakes, invasions, political and economic failures and diseases, writes National Geographic's Tom Metcalfe.

But more recently, archaeologists have considered that climate may have played a role. Previous evidence suggests the region where the Hittites reigned might have become drier and cooler between the 13th and 10th centuries B.C.E. In a new study published last week in the journal Nature, scientists use ancient tree rings to show that the area experienced three extremely dry years around 1198 to 1196 B.C.E., right around the empire's collapse. They propose that this particularly intense period of drought could have contributed to the end of the Hittites.

"One year of drought is a problem. Two years-it's a crisis. By three years in a row, perhaps it's actually more than a crisis," Sturt Manning, first author of the new study and an archaeologist at Cornell University, tells the Washington Post's Sarah Kaplan. "Seeing that back-to-back-to-back failure-that's probably what overthrows a major state."

Though drought alone may not have been enough to topple the Hittites, such a long-lasting dry period could have destabilized the empire, leaving it more vulnerable to other threats such as an invasion or famine and unrest, the researchers suggest. "We're not saying the climate solely caused the collapse of the Hittites," Manning tells Nature News' Miryam Naddaf. But it could have primed them for their demise.

Tree rings provide snapshots of an area's climate history. The researchers looked at timber from juniper trees recovered from an archaeological excavation in central Anatolia. The logs had been buried for almost 3,000 years and were from a burial mound associated with King Midas, located about 50 miles southwest of Ankara, Turkey, per National Geographic.

Twenty-three samples from around 18 different trees contained rings spanning the years 1775 to 748 B.C.E. The width of tree rings can indicate the amount of rainfall an area received-trees grow less when it's drier, and thus their rings are narrower during drier years. The researchers found that the rings of the junipers grew slimmer in the five decades before the Hittites fell, per the Post.

But the period from 1198 to 1196 B.C.E. was particularly dry-among the driest times the area had experienced in more than 600 years, Manning told Inside Climate News' Kristoffer Tigue.

Carbon isotopes in the wood, an indicator of the moisture available to trees, supported their finding. The isotopes indicated likely dry to very dry conditions between 1232 and 1192 B.C.E., with drier spikes from 1222 to 1221 B.C.E. and around 1195 B.C.E.-a peak of dryness that nearly coincided with the fall of the empire.

"There was likely near-complete crop failure for three consecutive years," Brita Lorentzen, a co-author of the paper and an anthropologist at the University of Georgia and Cornell's Tree Ring Laboratory, tells Reuters' Will Dunham. "This would have led to a collapse of the tax base, mass desertion of the large Hittite military and likely a mass movement of people seeking survival. The Hittites were also challenged by not having a port or other easy avenues to move food into the area."

An intense dry period could have put significant strain on the Hittite Empire. "A short, sharp drought would be enough to topple a very centralized state based heavily on grain and the gathering in and distribution of agricultural goods," Alan Greaves, an archaeologist at the University of Liverpool in England who wasn't involved in the study, tells New Scientist's Clare Wilson.

Harvey Weiss, an archaeologist at Yale University who did not contribute to the research, tells the Post that a longer-term drought likely played a bigger role than a three-year event. "Two or three years of drought are not much, but an abrupt mega-drought with high magnitude creates cascading effects," he tells Nature News.

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Will Sullivan is a science writer based in Washington, D.C. His work has appeared in Inside Science and NOVA Next.

ARCHAEOLOGY CLIMATE CHANGE

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Please visit the site: https://www.smithsonianmag.com/smart-news/severe-drought-may-have-contributed-to-the-decline-of-the-hittites-180981636/

PREHISTORIC WORLD HERITAGE SITE GOBEKLI TEPE SURVIVES TURKEY EARTHQUAKES, BY ING MORITZ KINZEL

Though Monday's earthquakes destroyed several historic sites, some of the iconic historical heritage that is invaluable to science as well as Turkey's economy has survived.

Two devastating earthquakes that hit Turkey and Syria only nine hours apart have killed more than 20,000 people and reduced tens of thousands of buildings to rubble, but two of Turkey's iconic world heritage sites miraculously remain with little or no damage.

Gobekli Tepe, the world's oldest known place of worship, appears to be undamaged despite being a mere 10 miles from Sanliurfa, one of the 10 provinces affected by the 7.8-magnitude quake. With the oldest megalithic structures ever found, it dates to the 10th millennium BC and has been included in UNESCO's World Heritage Sites list since 2018. The site, which means "potbelly hill" in Turkish, consists of T-shaped pillars carved with drawings of animals, abstract symbols and human hands surrounded by smaller inward-facing pillars. The site and its state-of-the-art museum with holograms and videos draw in millions, contributing to the country's tourism-reliant economy.

A spokesperson for the UN cultural agency UNESCO told Al-Monitor, "According to a preliminary damage assessment undertaken by the national authorities, the World Heritage site of Gobekli Tepe does not seem to have been damaged." Turkey's Culture Ministry also confirmed Thursday that the site, which is among the top five touristic sites in Turkey despite being away from the usual mass-tourism destinations, remains standing.

Some 180 miles to the north, the UNESCO-listed Arslantepe Mound has suffered some damage but nevertheless stands, according to UNESCO. The medieval site is located some 40 miles from the province of Malatya, one of the worst-hit provinces.

A temporary roof covering the museum, which hosts ruins of settlements dating back to 5,000 B.C., "would have collapsed in several areas and some slips can be observed in some of the adobe walls of the mound," according to the Paris-based UN agency.

Turkey's disaster zone lies in upper Mesopotamia and is part of a region called the "Fertile Crescent," a curve stretching from the Persian Gulf to upper Egypt and believed to be the site of the world's earliest civilization. Home to some of the world's richest archaeological sites, the region hosts hundreds of historical landmarks including the original location of Iraq's Hanging Gardens of Babylon and the Petra site in Jordan.

Monday's earthquakes took place at the highest point of this curve encompassing Turkey's southern and Syria's northern region, which is home to dozens of archaeological sites, monuments, historical edifices and ancient buildings, including several iconic UNESCO World Heritage sites. Besides Gobekli Tepe and the Arslantepe Mound, the area includes two more UNESCO-listed sites: Mount Nemrut, known for its

gigantic statues of gods commissioned by King Antiochos I of Commagene, the Diyarbakır Fortress and the Hevsel Gardens, located on an escarpment in the Upper Tigris River Basin and overlooking the historical city.

Whether there is damage on Mount Nemrut, which lies in the country's southeastern province of Adiyaman — one of the worst hit by the quakes — remains unknown, according to UNESCO. "The site is not accessible because of the weather conditions," the agency said. Television footage coming from the site since Monday's killer earthquakes showed rescuers scrambling to pull survivors from the debris under heavy snowfall. Turkey's Culture Ministry said Thursday that authorities have been "unable" to detect any damage to the structure. UNESCO had previously warned that the site, which hosts giant statues of ancient Greek and Persian gods and goddesses including Zeus, Ahura Mazda and Apollon, was "within a first-degree earthquake zone and is very close to the East Anatolian Fault" and "vulnerable to earthquakes."

At another world heritage site, Diyarbakır Fortress and Hevsel Gardens, "several buildings" collapsed, UNESCO said in a statement earlier this week.

But the fortress seems to have held better than the nearby Gaziantep Castle, parts of which were largely destroyed by the quakes. Yet Gaziantep's award-winning mosaic museum where Roman-era mosaics are displayed remains standing, the Culture Ministry said.

Hatay, one of the places hardest hit by the quakes, has seen the worst historical and architectural losses. The multireligious and multicultural province has been deemed an open-air museum, hosting more than a dozen landmark houses of worship cherished by believers from three religions.

Dozens of landmarks, buildings and historical edifices including mosques, churches and synagogues were flattened or severely damaged by the temblors in the province.

Among the most well known sites, the historical Habib-i Najjar Mosque was mostly destroyed, images circulating on social media show. Jewish community leaders in Turkey confirmed to Al-Monitor earlier this week that the main synagogue in central Hatay also sustained damage. The leader of Antakya's tiny Jewish community, Saul Cenudioglu, and his wife's bodies were recovered from under the rubble Thursday.

The social media accounts of a local Orthodox community also reported severe damage to the 19th-century St. Nicholas Greek Orthodox Church and the 19th-century Cathedral of the Annunciation in Iskenderun.

The plight of Cenovesean-era watchtower and UNESCO-listed ancient Vespasianus Titus Tunnel, which is located in the ancient Seleucia Pieria settlement, remain unknown.

The Paris-based agency said it could send a mission when time allows and if the Turkish government demands. "We have several mechanisms to help Syria and [Turkey] to restore and repair the damages," the agency's spokesperson said. "We can provide technical and scientific assistance as well as funds: UNESCO has a fund for Heritage in emergencies and the World Heritage Convention also manages a fund for this purposes."

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Archaeologist Ing Moritz Kinzel works at the Gobekli Tepe

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Please visit the site: https://www.al-monitor.com/originals/2023/02/prehistoric-world-heritage-site-gobekli-tepe-survives-turkey-earthquakes

SOLAR PANELS AT POMPEII

Ancient Roman ruins at Pompeii have been fitted with invisible solar panels, in a move that will contribute to the archaeological site's sustainability efforts and cut costs. The innovative panels, which blend into the background by imitating traditional materials, were installed on the House of Cerere, on a thermopolium — a Roman snack bar — and on the House of the Vettii, which recently reopened following 20 years of restoration work.

"They look exactly like the terracotta tiles used by the Romans, but they produce the electricity that we need to light the frescoes," said Gabriel Zuchtriegel, the director of the archaeological park of Pompeii, in a press release.

Each year, 3.5 million tourists explore the vast ruins of the ancient Roman city, which was buried by the eruption of Mount Vesuvius in 79 AD. But due to Pompeii's size, energy bills are expensive and conventional methods of providing power across the site can threaten its appearance.

"Pompeii is an ancient city which in some spots is fully preserved," Zuchtriegel said. "Since we needed an extensive lighting system, we could either keep consuming energy, leaving poles and cables around and disfiguring the landscape, or choose to respect it and save millions of euros." The new technology will help the archaeological site to cut energy bills and make it more enjoyable, he added.

The invisible solar panels — or "traditional PV tiles" as they are technically known — were created by the Italian company Dyaqua. They can be designed to appear like stone, wood, concrete or brick, and hidden on walls, floors and roofs, according to Elisabetta Quagliato, whose family owns Dyaqua, in the press statement.

"We are an archaeological site but we also want to be a real-life lab for sustainability and the valorization of intangible heritage," Zuchtriegel said. "Our initiative is not merely symbolic. Through the million tourists who visit us every year, we want to send a message to the world: cultural heritage can be managed differently and in a more sustainable way."

Other locations in Italy using the invisible solar technology are the commune of Vicoforte in Italy and, soon, Rome's contemporary art museum Maxxi. Public buildings in Evora, Portugal, and Split, Croatia will also install the panels, according to the press statement.

Pompeii's recent use of these panels is just the beginning, Zuchtriegel said. "From now on, we will be taking this solution into account for all future renovation and restoration projects."

Please visit the site: https://www.cnn.com/style/article/pompeii-dyaqua-solar-panels-tan/index.html [Go there for pix]

ARCHAEOLOGISTS STUNNED AT ANCIENT MOAT, HANDPRINTS FOUND IN JERUSALEM, BY JOANIE MARGULIES

This moat, now dry, was believed to have kept the first Crusaders from breaching the city of Jerusalem.

An ancient moat surrounding the Old City of Jerusalem was uncovered by archaeological experts with the Israel Antiquities Authority. This discovery was made as a contracting company prepared for planned infrastructure work for the city of Jerusalem.

Construction revealed the ancient moat, which measured approximately 10 meters wide and between two to seven meters deep. This moat surrounded the Old City of Jerusalem in its entirety. Just below this busy Jerusalem street lay a 1,000-year-old moat built to keep attacking enemies away from the city's walls. The moat was accompanied by handprints adjacent to the structure.

Zubair Adawi, the director of the excavations at Israel's Antiquities Authority, uncovered the moat and handprints underneath Sultan Suleiman Street. This street runs adjacent to the city walls, leading experts to believe that the moat was built to prevent enemies from breaking into the city of Jerusalem and invading.

"Moats, usually filled with water, are well-known from fortifications and castles in Europe, but here the moat was dry, its width and depth presenting an obstacle slowing down the attacking army," Adawi said.

The city walls we see today in the old city were erected in the 16th century by the Turkish Ottoman Sultan Suleiman I. "The earlier fortification walls that surrounded the ancient city of Jerusalem were much stronger," Dr. Amit Re'em, Jerusalem regional Director at the Israel Antiquities Authority stated. "In the eras of knights' battles, swords, arrows, and charging cavalry, the fortifications of Jerusalem were formidable and complex, comprising walls and elements to hold off large armies storming the city."

Why would ancient Jerusalem need a moat to defend itself?
Historically, moats were built to keep attackers away. This moat, now dry, was believed to have kept the first Crusaders from breaching the city. Historians from the age of the First Crusade placed the fighters at the walls of Jerusalem in June 1099. It took the fighters approximately five weeks to cross the waterway after tedious strategic planning, archaeologists involved with the excavation say.

After finally crossing, Crusaders were met with force and bloodshed by Jews and Muslims defending the city.

"Armies trying to capture the city in the Middle Ages, had to cross the deep moat and behind it two additional thick fortification walls, whilst the defenders of the city on the walls rained down on them fire and sulfur," Re'em said.

"As if this wasn't enough, there were secret tunnels in the fortifications, some of them uncovered by the Israel Antiquities Authority archaeologists in previous excavations, whereby the city defenders could emerge into the moat and attack the enemy by surprise, and then disappear back into the city."

"In the eras of knights' battles, swords, arrows, and charging cavalry, the fortifications of Jerusalem were formidable and complex, comprising walls and elements to hold off large armies storming the city."

As for the handprints; this remains an outstanding question to all.
"Does it symbolize something? Does it point to a specific nearby element? Or is it just a local prank? Time may tell," researchers say.

Please visit the site: https://www.jpost.com/archaeology/article-729562 [Go there for pix]