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Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Ιούνιος 2025 -

Courage is knowing what not to fear. (Plato)

Newsletter of the Hellenic Society of Archaeometry

- June 2025 -

Nr. 291

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ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS
TRENDS IN HERITAGE SCIENCE, 10TH JULY,
2025, UNIVERSITY COLLEGE LONDON,
LONDON, UNITED KINGDOM

Dear colleagues

The National Heritage Science Forum (NHSF) is delighted to announce that registration is now open for its first annual conference on the theme Trends in Heritage Science which will take place in-person on 10th July at University College London, Engineering Front Building, Malet Place, London WC1E 7JE, United Kingdom.

The conference will bring together people from many different disciplinary backgrounds including scientists, researchers, conservators, and curators. Through a combination of presentations and discussion sessions we will explore the role of heritage science research and innovation in addressing global challenges, this year focusing on:

- The economic value of heritage science
- Sustainable historic buildings
- Digital innovation in heritage science

See the full programme here: <https://www.heritagescienceforum.org.uk/what-we-do/programme-register-2025>

In addition, there will be a wide-ranging poster session, opportunities to network with our exhibitors, and a choice of three workshops:

- Lifecycle Assessments to Measure the Impact of Heritage Science
- RICHeS: Empowering Conservation and Heritage Science through a Distributed Research Infrastructure
- Speed Mentoring for Emerging Professionals

Registration is open until 20th June 2025. Please book here: <https://www.tickettailor.com/events/nationalheritagescienceforum/1645544>

£75 NHSF Members (including members of Icon, the Institute of Conservation)
£50 Students
£150 Non-members

We are pleased to provide 6 bursaries to support attendance at the conference. Further information is available at: <https://www.heritagescienceforum.org.uk/what-we-do/programme-register-2025>

The deadline for bursary applications is 29th May 2025.

Caroline Peach

On behalf of National Heritage Science Forum

"NEU4 HERITAGE SCIENCE", SEPTEMBER 2025, BOSCO CHIESANUOVA, VERONA, ITALY

Dear colleague,

it is with great pleasure we announce the 1st SISN (Italian Society for Neutron Science) thematic workshop and crash course

"NEU4 Heritage Science" in September 2025 in Bosco Chiesanuova - Verona, Italy.

Neutron4: Heritage Science is a workshop dedicated to the applications of neutron techniques in Heritage Science for the non-destructive technological study of ancient artefacts and materials.

The workshop will start with a one-day crash course on neutron techniques, followed by a two-day conference with the keynote lectures by Gilberto Artioli (University of Padova) and Monica Galeotti (Opificio delle Pietre Dure, Firenze).

Neutron4 is organised by the Società Italiana di Scienze Neutroniche (SISN) and it will be held from 9th to 12th September 2025 in Bosco Chiesanuova (Italy), a small mountain village near Verona.

Details can be found on the SISN website dedicated page:

Neutron4 website: www.sisn.it/neutrons4/

Contacts: info@sisn.it

We are looking forward to meet you all there.

Best regards,

the NEU4 Heritage Science organizing committee

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4TH ANNUAL INTERNATIONAL CONGRESS ON ROMAN BIOARCHAEOLOGY, AUGUST 31-SEPTEMBER 2, ZAGREB, CROATIA

Get your abstracts polished and your suitcases ready for the 4th Annual International Congress on Roman Bioarchaeology! This year, we're digging into the ancient Roman World both online and in-person at the beautiful Archaeological Museum in Zagreb, Croatia.

This is a great opportunity for both seasoned researchers and students new to the field to participate in a small and convivial academic conference! We welcome submissions for podium and poster presentations related to human osteology, zooarchaeology, ancient DNA, isotopic studies, mortuary archaeology, palaeoethnobotany, and archaeoethnology in and around the Roman world.

Sunny weather, delicious food, and cutting-edge research await you in Zagreb! Whether you're presenting or just passionate about all things Roman, you won't want to miss this year's conference!

The abstract submission portal for #ICORB2025 is now open!

Download the abstract template and submit your presentation at:
<https://www.icorb.org/annual-conference>

The abstract submission portal will close on 9 June 2025 at 11:59 PM EST (New York time zone) and we will notify applicants of our decision shortly thereafter. If you have a question about whether your project would be considered, please reach out to us at teamicorb@gmail.com! We look forward to gathering with you in Zagreb!

On behalf of the Organizing Team,

Mario Novak, Institute for Anthropological Research, Zagreb, Croatia

Please visit the site: <https://mailchi.mp/f805890047c4/4th-annual-international-congress-on-roman-bioarchaeology>

NEUTRON4: HERITAGE SCIENCE **WORKSHOP, 9-12 SEPTEMBER 2025, BOSCO** **CHIESANUOVA, ITALY**

Dear colleagues,

it is with great pleasure to announce that the Italian Society for Neutron Science SISN is organising Neutron4: Heritage Science, a workshop dedicated to the applications of neutron techniques in Heritage Science for the non-destructive technological study of ancient artefacts and materials.

Neutron4: Heritage Science will be held from 9th to 12th September 2025 in Bosco Chiesanuova (Italy), a small mountain village near Verona. The workshop will start with a one-day crash course on neutron techniques, followed by a two-day conference with the keynote lectures by Gilberto Artioli (University of Padova) and Monica Galeotti (Opificio delle Pietre Dure, Firenze). Further details can be found on the attached leaflet and the Neutron4 website: www.sisn.it/neutrons4/

We are looking forward to meet you all there.

Best regards,

the NEU4 Heritage Science Organizing Committee

Marco Zanatta

Professore Associato

[Laboratorio di Struttura e Dinamica dei Sistemi Complessi](#)

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ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –
JOB VACANCIES/FELLOWSHIPS

POSTDOCTORAL RESEARCH FELLOW,
HERITAGE SCIENCE, UNIVERSITY OF OSLO

A Postdoctoral Research Fellowship is available for a Heritage Scientist at the Department of Archaeology, Conservation and History (IAKH), University of Oslo.

The position is for a fixed term of three years within the scope of the project [POLYCHROME – "The Survival of Damaged Medieval Polychromed Heritage in the Nordics"](#). POLYCHROME is funded by the European Research Council between 2024 and 2029 (Grant Agreement number 101125383).

The successful candidate will join a multi-disciplinary research team, with primary responsibilities related to imaging and examination of medieval polychromed objects in museums and churches across Norway, Sweden and Denmark. Duties include extensive travel in a mobile laboratory, with portable X-radiography, Hirox 3D microscopy, micro X-ray fluorescence spectroscopy, and spectral imaging. Data gathering must adhere to the strict timeframe for POLYCHROME that has been agreed between the European Research Council and the University of Oslo. Duties also include data treatment, data interpretation, publication, administration, and teaching (10%), which can include training for basic teaching qualifications.

The successful candidate should take up the position between 1 October 2025 and 15 January 2026.

The full advertisement and instructions for applicants are available here: <https://www.jobbnorge.no/en/available-jobs/job/280491/postdoctoral-research-fellow-at-the-department-of-archaeology-conservation-and-history>

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POLYCHROME (ERC, 2024–2029):
<https://www.hf.uio.no/iakh/english/research/projects/polychrome/index.html>
Sacred Medieval Objects and Their Afterlives in Scandinavia (Leiden: Brill, 2025)
<https://brill.com/display/title/70835>
UiO webpages: <http://www.hf.uio.no/iakh/english/people/aca/noellels/index.html>
<https://orcid.org/0000-0001-5421-132X>

ARCHAEOMETALLURGY RESEARCH **ASSISTANT JOB AT CAMBRIDGE**

Dear friends and colleagues,

Please help us spread the word about this opportunity to join the Reverseaction team at Cambridge to work on the analysis of pre-Hispanic gold artefacts from Colombia.

More information: <https://www.jobs.cam.ac.uk/job/51186>

Deadline 30 May.

Thank you, and best wishes,

Marcos

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www.reverseaction.org

www.baskervillepunches.org

PHD POSITIONS AT THE NTNU UNIVERSITY MUSEUM / THE TRONDHEIM LAB

Dear all,

The University Museum, one of the faculties of the Norwegian University for Science and Technology (NTNU), has just posted this PhD opportunity:

[PhD-positions at the NTNU University Museum - NTNU](#)

The PhD topic is open, but should be coordinated with one of the University Museum's research groups. The National Laboratory for Age Determination is such a research group. PhD projects about radiocarbon dating, dendrochronology, stable isotope studies and related fields are therefore included in this call.

Beste hilsener/best regards,
Bente Philippsen

Førsteamanuensis
Leder for Nasjonallaboratoriene for datering
NTNU Vitenskapsmuseet

Associate professor
Leader of the National Laboratory for Age Determination
NTNU University Museum
Trondheim, Norway

FUTURE TENURE TRACK POSITION IN FRANCE

Dear all,

The French National Centre for Scientific Research (CNRS) is recruiting 59 Junior Professorships (CPJ) in a wide range of scientific fields, from sustainable metallurgy and artificial intelligence to open science and the habitability of the Earth. This contract provides a dedicated financial environment upon joining the CNRS, and includes teaching activities in an university. These positions are offered on fixed-term contracts (CDD) under public law for a duration of 3 to 6 years. Following evaluation of scientific value and professional aptitude by a tenure commission, tenure will be granted as a CNRS Senior Researcher (Directeur de Recherche).

This year, one of the proposed profile is dedicated to “Evolution of Heritage artefacts”. Only 5 laboratories in France are allowed to host this Junior Professorship. Among these labs, is our own, the LAPA team (<https://iramis.cea.fr/en/nimbe/lapa/>) of the Institute of Research for Archaeomaterials (IRAMAT - UMR7065), located at University of Paris-Saclay. Thus, if you want to propose a research project and teaching program dealing with metals or inorganic materials, feel free to contact me or other faculty of the IRAMAT LAPA. The deadline for candidating is the 14th of July.

More details about the candidate profile, the project and the way to apply :
<https://emploi.cnrs.fr/Offres/CPJ/CPJ-2025-046/Default.aspx>
<https://carrieres.cnrs.fr/en/chair-recruitment/>

Do not hesitate to ask me more details

Philippe Dillmann

Laboratoire Archéomatériaux et Prévision de l'Altération : IRAMAT UMR7065 CNRS et
NIMBE UMR3685 CEA/CNRS

<https://iramat.cnrs.fr/>

<http://iramis.cea.fr/nimbe/lapa/>

<http://archeometrie.cnrs.fr/>

<https://remarch.hypotheses.org/1>

Adresse postale

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91191 Gif sur Yvette Cedex

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ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

METALWORK WEAR ANALYSIS: AN IN- PERSON MASTERCLASS, 9-11 JUNE 2025, NEWCASTLE UNIVERSITY, UK

Dear friends and colleagues,

I will be grateful if you could please advertise the following masterclass to any interested parties. This is a small-group, in person course targeting delegates with some previous experience with use-wear analysis on metals or other materials. Could those in doubt please contact me to discuss whether this is suitable for them (it might be for certain beginners).

Registration is open through the following link. I believe there are only 6 places available out of 12, so anyone interested should please register soon to avoid disappointment. Delegates will be asked to pay a £170 registration fee to secure a place, which includes access to online learning material and refreshments but not lunch:
<https://cpd.ncl.ac.uk/courses/course-detail/?id=2f0cb76d-fa0e-f011-998a-000d3ad509de>

If you experience any problems whilst trying to register, could you please contact:
llahub@newcastle.ac.uk

For any other queries, could you please contact the course organiser:
andrea.dolfini@ncl.ac.uk

Please see below for further details. Best wishes,

Andrea

Brief Course Description: This three-day in-person masterclass provides hands-on experience in Metalwork Wear Analysis (MWA) for participants already familiar with the method. Under expert supervision, delegates will refine their observational and interpretative skills through direct analysis of original and replica copper-alloy objects.

Time and Venue: 9-11 June 2025, Wolfson Laboratory (King George VI building, room 2.60), Newcastle University, UK.

Full Course Description

This three-day in-person masterclass is designed for those who have previously attended an online introductory course or have prior knowledge of Metalwork Wear Analysis (MWA). It offers an opportunity to apply and develop practical skills in identifying, evaluating, and interpreting wear traces on prehistoric copper-alloy artefacts.

Working individually and in small groups, participants will examine objects from Newcastle University and Great North Museum's world-class collections using Leica EZ4-W stereomicroscopes. Through guided practice sessions and discussions, they will

refine their ability to distinguish manufacturing marks, use-wear patterns, repair traces, and post-depositional modifications, including those related to conservation. A copy of the learning material, a reading list, and a certificate of attendance will be provided. This masterclass is ideal for students, researchers, museum professionals, and conservators seeking to deepen their expertise in MWA and enhance their ability to work with archaeological copper-alloy artefacts.

Learning Outcomes: To gain hands-on, advanced practical knowledge of Metalwork Wear Analysis, including the recognition and interpretation of manufacturing, usewear, and post-depositional traces observed on prehistoric copper-alloy axeheads, spearheads and swords.

Equipment: Could delegates please bring their own MS-Windows laptop. Please email the course instructor if you only have a Mac laptop, or no laptop at all: andrea.dolfini@ncl.ac.uk

Instructor

This masterclass is led by Professor Andrea Dolfini, a world leader in the microscopic and experimental analysis of prehistoric copper-alloy objects. He will guide participants through the analysis and answer their questions.

Programme

Monday 9th June, KGVI 2.60, 9.30-16.30

9.30-12.30: Course introduction – microscopes and imaging software – analysing axeheads

12.30-13.30: Lunch break

13.30-16.30: Analysing axeheads (including replica objects)

Tuesday 10th June, KGVI 2.60, 9.30-16.30

9.30-12.30: Analysing spearheads and swords

12.30-13.30: Lunch break

13.30-16.30: Analysing spearheads and swords (including replica objects)

Wednesday 11th June, KGVI 2.60, 9.30-13.30

9.30-13.30: Taking and analysing silicone casts

Andrea Dolfini (he/him)

[Professor of Archaeology](#)

[Convenor of Materiality, Artefacts & Technologies in Culture and History \(MATCH\)](#)

Scientific Committee Member, [European Association of Archaeologists](#)

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<http://newcastle.academia.edu/AndreaDolfini>

Download my latest Open Access papers for free:

- Dolfini, A., Scholes, S.C., Collins, J., Hardy, S. and Joyce, T.J., 2023. Testing the efficiency of Bronze Age axes: An interdisciplinary experiment. *Journal of Archaeological Science*, 152, p.105741: <https://doi.org/10.1016/j.jas.2023.105741>

Caricola, I., et al., 2022. Organic residue analysis reveals the function of Bronze Age metal daggers. *Nature: Scientific Reports* 12(6101): <https://doi.org/10.1038/s41598-022-09983-3>



INTERNET SITES

ONLINE VERSION OF ARIADNE'S THREAD EXHIBITION LAUNCHED

Dear all

We would like to share with you the online version of the Stelida Naxos Archaeological Project's new exhibition - Ariadne's Thread: Weaving 200,000 Years of Naxos' History - a poster and video based phenomenon thus far hosted in Hamilton, Toronto and Naxos (reopening at the Ursuline School, Chora on the 22nd for a month); the website also enables you to access our 2018 exhibit (Neanderthals on Naxos!) and in both instances we provide an English, Greek and French version:

<https://www.stelida.org/>

All the best

Tristan Carter & Shannon Crewson

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1280 Main Street West, Hamilton
ON, L8S 4L9, CANADA

Director Stelida Naxos Archaeological Project <http://www.stelida.org/> [SNAP]
Director Freston Archaeological Research Mission <https://facsocsci.mcmaster.ca/freston-archaeological-research-mission-farm> [FARM]
Director McMaster Archaeological
XRF Lab <http://maxlab.mcmaster.ca/> [MAX Lab]

NEES EKΔΟΣΕΙΣ – NEW PUBLICATIONS

LANDSCAPES THROUGH TIME: GEOARCHAEOLOGICAL PERSPECTIVES ON LATE HOLOCENE CHANGES AT PEFKAKIA, THESSALY, BY NIEBIESZCZAŃSKI, J., LIS, B., BATZIOU, A., HILDEBRANDT-RADKE, I., VEROPOULIDOU, R., HERBICH, T., RYNDZIEWICZ, R., RZODKIEWICZ, M., WOCHAL, D., DOMAŃSKA-SIUDA, J.

(2025).. *Environmental Archaeology*, 1–17.
<https://doi.org/10.1080/14614103.2025.2500125>

ABSTRACT

The Pefkakia archaeological site, located in Thessaly, is known have been inhabited since the Late Neolithic up to Hellenistic times, with a temporary harbor during the Late Bronze Age. The first palaeogeographical research in the area pointed to landscape transformation during the Holocene due to marine transgression. In this study, we applied multidisciplinary geoarchaeological research (coring and palaeoecological analyses) supported by AMS dating to reconstruct landscape changes during particular periods of prehistory. According to the results, the maximum marine transgression occurred around the beginning of the Late Holocene and cut off a part of the prehistoric site (Magoula) from the mainland. The water body changed from a marine to marshy environment owing to possible tectonic uplift or erosion. The time of this change was dated to the 2nd half of the 2nd mill.BC, at the time of the Late Bronze Age occupation of the site. The final change to the terrestrial environment, possibly by anthropogenic deposition, is dated to the 4th/3rd c.BC when the ancient city of Demetrias was functioning. Our study indicates significant changes in the environment surrounding the site of Pefkakia, thus enabling interpretation of functional aspects of human adaptation.

KEYWORDS:

Aegean archaeology, geoarchaeology, landscape changes, Mycenaean culture, Late Bronze Age Thessaly, prehistoric archaeology

Please visit the site:

<https://www.tandfonline.com/doi/full/10.1080/14614103.2025.2500125#abstract>

**ANCIENT SCIENCE AND TECHNOLOGY OF
COLOUR. PIGMENTS, DYES, DRUGS AND
THEIR EXPERIENCE IN ANTIQUITY,
BY MATTEO MARTELLI, MARIA MICHELA
SASSI**

Technai, 13-14. Pisa; Rome: Fabrizio Serra Editore, 2023. 2 vols. Pp. 384.
ISBN 9788833155258.
BMCR 2025.05.25

Review by Alessandro Di Ludovico,
Museo di Scultura Antica Giovanni Barracco, Roma;
Project MASPAG, Sapienza Università di Roma.
alediludo@gmail.com

Open Access (vol. 13 [2022]):

<https://www.libraweb.net/articoli.php?chiave=202210501&rivista=105>

Open Access (vol. 14 [2023]):

<https://www.libraweb.net/articoli.php?chiave=202310501&rivista=105>

This book derives from a 2022 conference. Through the exploration of ancient texts, the examination of archaeological data and the use of archaeometric analyses, the presenters at this conference addressed subjects related to the use and conceptualisation of colour in the cultures of ancient Western Asia, Egypt and the Graeco-Roman Mediterranean through various approaches. The contributions presented in that meeting have, with one exception, been collected and published by the conference organizers in an open access format in two consecutive issues — n. 13 (2022) and n. 14 (2023) — of the journal *Technai*.^[1]

The collection of essays in the first volume are preceded by a short introduction by Martelli and Sassi.^[2] The approach of the contributions is varied but they are mainly based on technical issues. The editors have understandably organised the papers following geographical and chronological criteria, but have also distributed them in a logical manner, grouped according to main topic. Following the introduction are three chapters dealing with means and techniques for colouring and producing coloured materials in antiquity. The first two chapters deal with first millennium-BC Mesopotamian texts. Shiyanthi Thavapalan discusses stained glass production processes and secondary uses, as described in cuneiform texts which were training materials for scribes rather than manuals for glassmakers. Special attention is paid to the use of fire and water in such production processes and on the specific vocabulary (in Akkadian) related to both procedures and colours. In the second chapter Eduardo A. Escobar illustrates the dyeing practices described in a fragmentary Neo-Babylonian tablet, with their cultic and technical features and implications. The third chapter, by Gil Gambash, Beatrice Pestarino and David E. Friesem, focuses on the complex theme of trade, collection and production of raw materials, semi-finished and finished products regarding purple pigments and dyes in the ancient Mediterranean. The archaeological and historical

view proposed here gives an innovative and rich frame for the collection and use of murex and purple dyes in the ancient world.

The successive group of articles instead concerns ancient alchemical traditions and the most appropriate ways of interpreting and using them from a historical-archaeological standpoint. Matteo Martelli explains the developments of an investigation about ancient alchemical beliefs and practices, contextualising them historically and culturally. As well as an in-depth treatment of the so-called ‘water of sulphur’ (or ‘divine water’), Martelli illustrates the laboratory experiments carried out by his team. In such experiments the instructions from ancient alchemic texts on colouring metals were put into practice, obtaining inspiring and intriguing results. Cristina Viano addresses the theme of the “noir alchimique” (alchemic black), exploring the possible etymologies of the Greek word *chêmeia*. Her investigation, which is thorough and of great interest, shows how basic alchemic knowledge must have originated in Egypt, then was subsequently acquired by the Greeks, later transmitted to the Romans and finally inherited by medieval Mediterranean cultures. The Greek name itself *chêmeia* (from which — through Arabic — alchemy derives) should probably be related to the land of Egypt, which was called *km.t* in ancient Egyptian and *khme* in Coptic. The next paper, by Vinzenz Brinkmann and Ulrike Koch-Brinkmann, proposes case studies and experiments related to the polychromy of ancient Greek and Roman bronze sculptures. Chemical treatments, and especially patination, carried out in antiquity in order to give metals and their alloys a specific surface colouring, are the central subject of the study. The subject matter is similar to that of Martelli’s contribution, but this work is more focused on detectable clues and reconstructions and less on laboratory experiments. As in the previous two chapters, Greek and Roman technical knowledge of metal treatment and transformation is seen as a development of the Egyptian tradition. Both in this and in Martelli’s work the experiments and the observations described are precise and convincing, but at least one relevant issue is missing: the processes and dynamics that over the centuries have caused the almost total discolouration of almost all surfaces treated in the ways described (and any concerns the ancients had regarding this matter).

These three articles dealing with alchemic knowledge, archaeometry and experimental approaches concludes the first volume, while the second begins with three papers that follow a logical thread focused on the coloured materials and pigments used to decorate and paint objects and architecture.

In the second volume, Brinkmann and Koch-Brinkmann investigate the value, production and use of blue pigments in antiquity, with a special focus on Greek sculpture. The Greeks had a variety of techniques to produce the blue colours for sculptures, and here the authors highlight the direct or indirect links between Hellenic craftsmanship and the Egyptian tradition, while also stressing the importance of the long-distance trade of raw and processed materials in antiquity. As in other papers of this collection (such as that by Escobar and the other contribution by these two authors), an important point is justly placed in the spotlight here: the value that some qualitative features of colours and coloured surfaces, especially brightness, had for many ancient cultures. This results from the analyses the authors had carried out on the features of Greek architectural elements and sculptures: “... the material is quasi secondary: the main concern was to create brilliant, intense blues – or reds” (p. 42); “So here again it was a matter of the luminosity of the blue; the choice of material was individual and came second” (p. 43).

In the following chapter, Hariclia Brecolaki and Giovanni Verri explain the complexity of the use of pigments in ancient Greek and Roman paintings, in particular in the representation of eyes and faces. They argue that this was not only a question of choosing the most suitable pigments but also, from a technical point of view, of the ability to combine different colours to achieve a specific result, and, from an expressive point of view, of duly employing the nuances and symbolic references of the chosen hue (e.g., mixing blue and white pigments to obtain a white colour suitable for the “bright” eyes of a “brave and stout-hearted man”, p. 57). This investigation involves also the use of visible-induced luminescence (VIL) and ultraviolet-induced luminescence (UIL).

Book 35 of Pliny the Elder’s *Natural History*, dedicated to painting, is the subject of the next contribution by Agnès Rouveret. Combining evidence from Pliny with examples of the ancient use in painting of light, shades and colours, the investigation takes into account the values attributed to the colours and their uses in ancient painting, values that pertain to a tradition which certainly goes back at least as far as Hellenistic Greece and seems to continue in Republican and Imperial Rome. There were four basic pigments considered to make up the complete kit for creating contours, any hue useful for naturalistic representations and any kind of light or shadow effect, through their fine and well-calibrated juxtaposition, superimposition or mixing.

The last three contributions in this collection do not fit into one common group. Like Rouveret, Chiara Ballestrazzi begins her discussion with some explanations present in Pliny the Elder’s *Natural History*, drawing from Book 37 to discuss colour of gemstones in ancient Rome. The many possible hues of gemstones are discussed in relation to their social and cultural meaning, including their association with prestige, gender and gender roles, and the intrinsic masculinity or femininity of gems. Part of the essay deals with glass imitations and, more interesting, the recipes of the Stockholm Papyrus (which is part of the Graeco-Egyptian heritage) regarding the artificial colouring of stones in order to make them resemble precious gems (alchemic practices that recall those mentioned by Martelli).

Effie Photos-Jones tries to solve the origin of red Lemnian earth/miltos. The core of the enigma is the origin of the red or reddish colour shown by ancient clay sealed artefacts, resembling tokens, which were considered to be (and used as) a medicine with exceptional properties. Ancient authors had different explanations for this question, and to assess their truthfulness Photos-Jones can only rely on an ancient description of a ritual for the production of such artefacts, and on analyses of similar objects later produced between the 16th and 18th centuries. She suspects that the colour and healing properties of Lemnian Earth could be due to the presence in its composition of hematite and some fungal species.

Maria Michela Sassi’s closing essay is a fitting conclusion to the publication. Sassi describes the ideas and symbols related to colours and their nature in ancient Greek culture, stressing the analogies with other civilisations (e.g., the importance attached to brightness). Such ancient conceptions are discussed within the context of both ancient and modern theories about colours, and the discussion is significantly enriched with the critical use and analysis of views developed in anthropological and ethnolinguistic literature, beginning with the cross-cultural primary role seemingly played by the colours black, white and red.

Overall this collection of essays is successful in exploring symbolism and technical aspects regarding the production, use and perception of colors in antiquity, and offers insights and research results that are innovative and of great interest, given their potential for future development. The approaches of the researchers and the issues they address are varied and the methodological reflections, the study of ancient sources and the quantitative and experimental applications are generally well balanced. It is also worth emphasising that the cultural aspects and perceptual peculiarities of the different cultures are duly taken into account by all authors, as are the technical aspects concerning the use, production and conception of colours in antiquity. This valuable publication will be appreciated by specialists in ancient art and technologies and could work well also as a teaching tool for advanced classes.

Authors and Titles

Volume 1

Matteo Martelli and Maria Michela Sassi, Ancient science and technology of colour: an introduction

Shiyanthi Thavapalan, How to do things with fire and water: some observations on the theory and practice of crafts in Mesopotamia

Eduardo A. Escobar, Colour and cultural maintenance in ancient Babylonia: Contextualizing wool dye recipe BM 62788 + BM 82978

Gil Gambash, Beatrice Pestarino and David E. Friesem, From murex to fabric: the Mediterranean purple

Matteo Martelli, Transmuting tinctures: water of sulphur, quicklime, and “washes” in Graeco-Egyptian alchemy

Cristina Viano, Noir alchimique: questions d’étymologie et de transmutation

Vinzenz Brinkmann and Ulrike Koch-Brinkmann, Preliminary considerations on the aesthetics and narration of ancient Greek and Roman bronze sculpture: three case studies and two experiments

Volume 2

Vinzenz Brinkmann and Ulrike Koch-Brinkmann, Tracking blue: some remarks on blue colour materials in the polychromy of ancient Greek sculpture

Hariclia Brecolaki and Giovanni Verri, “From the face and the expression of the eyes”: multidisciplinary studies of pigments in ancient Greek and Roman painted surfaces

Agnès Rouveret, Certamen artis ac naturae: couleurs et matières dans la définition plinienne de la peinture (Histoire naturelle, livre 35)

Chiara Ballestrazzi, The colours of gemstones in Pliny the Elder’s Natural History, Book 37

Effie Photos-Jones, Pigments giving more than colour: the case of Lemnian earth or miltos

Maria Michela Sassi, A few remarks on the relationship between materials, technology and colour experience in ancient Greece

Notes

- [1] A short summary of the missing paper by Agnese Benzonelli on artificially patinated “black bronzes” appears as an appendix to the introduction by Martelli and Sassi.
[2] Each volume also includes an unrelated article.

Please visit the site: <https://bmcr.brynmawr.edu/2025/2025.05.25/>

**USE-WEAR ANALYSES OF MACRO-LITHIC
ARTEFACTS FROM THE EARLY BRONZE
AGE SITE OF DHASKALIO, CENTRAL
AEGEAN, UNVEIL THEIR USE AS TOOLS
FOR METALWORKING, BY DIEGO CAPRA,
ISABELLA CARICOLA, GIULIO LUCARINI,
GIUSEPPINA MUTRI, MYRTO
GEORGAKOPOULOU, MICHAEL J. BOYD,
EVI MARGARITIS AND COLIN RENFREW**

Journal of Archaeological Science: Reports, Volume 65, 2025,
<https://doi.org/10.1016/j.jasrep.2025.105197>

Abstract

The site of Dhaskalio is located on an islet at the western end of the island of Keros in the central Aegean. Excavations brought to light the remains of an extended building complex on Dhaskalio and a ritual centre in the Kavos area of Keros, dated to the Early Bronze Age (EBA), ca. 2750–2250 BCE. Finds on Dhaskalio include an abundant assemblage of macro-lithic tools. Use-wear analysis allows us to define them as grinding, casting, hammering and abrading or polishing tools. The preliminary results of an ongoing use-wear study combining low and high-power approaches suggest that the examined items were utilised in different phases of metal object manufacture. Additionally, lead residues have been found using X-ray fluorescence spectroscopy (pXRF) analysis on a grinding slab. Our research provides preliminary results concerning this craft activity undertaken at Dhaskalio, supporting the hypothesis that the site may have acted as a centre for specialised artisans within a broad regional network.

Keywords: Dhaskalio; Macro-lithic tools; Metalworking; Use-wear analysis; pXRF analysis

Please visit the site:

<https://www.sciencedirect.com/science/article/pii/S2352409X25002305>

OCHRES AS EARTH PIGMENTS IN HELLENISTIC AND ROMAN POLYCHROMY: STATE OF THE ART AND FUTURE DIRECTIONS ON MATERIAL ORIGINS AND TRADE, BY ARIADNE MARKETOU AND ALEXANDRA RODLER

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Abstract

Ochres are naturally occurring materials that are abundant in various geological environments and geographic regions and that have been used for a range of different purposes throughout history. Their wide use as pigments in ancient art is well-documented and, due to their abundancy, it is often presumed that ochres were extracted from locally available sources. However, ancient literary sources underline a preference for ochres from specific regions and provenance is viewed as a signifier for different properties, uses, and values. Despite the evident importance of ochre provenance for Hellenistic and Roman art, research on the topic remains scarce. This review paper aims to bridge archaeological and literary evidence with science-based methodological approaches that contribute to ochre provenance research. Firstly, an overview of ancient texts discussing terminology and the significance of ochre provenance and trade during the Hellenistic and Roman period is presented. Secondly, archaeological science-based approaches to ochre provenance research are reviewed, sketching out the contribution of interdisciplinary research to ancient ochre research, with a focus on evaluating possible raw material sources. Finally, this paper explores future directions that could contribute to the contextualisation of science-based approaches of ochre-provenance research within the framework of Classical Mediterranean archaeology, a period for which textual and historical evidence complement archaeological finds.

Keywords: Iron-oxides; Provenance research; Petrography-mineralogy; Geochemistry; Geology; Red pigments; Yellow pigments

Please visit the site:

(<https://www.sciencedirect.com/science/article/pii/S0305440325001256>)

ΕΙΔΗΣΕΙΣ - NEWS RELEASE

4,500-YEAR-OLD CLAY TOYS FOUND IN SYRIA

Discovery suggests ancient parents bought professionally made toys for their children 4,500 years ago.

Researchers at the National Museum of Denmark made an accidental discovery of 9 clay rattles made in Hama, Syria, dating back to the Bronze Age. This represents the largest collection of clay rattles of its kind from that period, according to France 24.

The toys, difficult to recognize due to being discovered in fragments during excavations, offer a glimpse into the lives of children 4,500 years ago. The rattles were found to contain inclusions within the clay that are exactly the same as those found in ordinary vessels made by professionals, indicating that these toys were crafted by artisans rather than by amateurs or parents themselves.

"If you wanted to entertain your child, you could give them a wooden spoon or a stone," said Mette Marie Hald, who has been studying these artifacts.

Hald expressed hope that the study would encourage specialists to examine clay pieces more closely. "It may turn out that other items are toys, such as some statues," she said. "They are often classified as statues placed in temples, but we wonder if they were toys made for children, because they are diverse and look very funny."

The discovery challenges previous assumptions about certain artifacts. Even in ancient times, for those who couldn't make things with their own hands, there was the option to purchase professionally made toys. "4,500 years ago, parents went to the market and bought toys made by professionals," Hald emphasized.

To assist in identifying similar artifacts in the future, the researchers developed a guide to help in the identification of these rattles. This tool aims to aid archaeologists in recognizing toy fragments that might otherwise be overlooked or misclassified.

This demonstrates that the trade of children's toys is not a modern invention. It existed millennia ago, as evidenced by these clay rattles from the Bronze Age in Hama, Syria.

Please visit the site: https://www.jpost.com/archaeology/archaeology-around-the-world/article-854382#google_vignette [Go there for pix]

ARCHAEOLOGISTS DISCOVER LOST EGYPTIAN TOMB HIDDEN BEHIND FALSE DOOR, BY LYDIA PATRICK

Archaeologists have uncovered a tomb belonging to an ancient Egyptian prince concealed behind a massive false granite door in the Saqqara necropolis, south of Cairo.

The tomb was constructed for Prince Wussar F Ra, the son of King Usar-Kaf—one of the first rulers of Egypt's Fifth Dynasty (circa 2494–2345 BCE).

The discovery was made by a joint Egyptian archaeological mission between the Supreme Council of Antiquities and the Dr. Zahi Hawass Foundation for Archaeology and Heritage.

The Ministry of Tourism and Antiquities shared the finding on their Facebook page.

Newsweek has reached out to the ministry for comment via social media.

Saqqara, the vast necropolis of ancient Memphis, is one of Egypt's most important archaeological sites.

Home to the famous Step Pyramid of Djoser—the oldest pyramid in Egypt—it served as a burial ground for pharaohs and officials across multiple dynasties.

Among the most striking elements of the discovery is a massive pink granite false door, the first of its kind found at this scale, measuring around 15 feet high and 4 feet wide.

Carved with detailed hieroglyphic inscriptions, the door bears Prince Wussar F Ra's full list of titles, including "the crown prince and ruler".

The tomb also held a surprising array of relics from multiple periods. Notably, a statue of King Djoser, his wife, and his ten daughters was found inside the tomb.

Zahi Hawass, archaeologist and former Minister of Antiquities, explained that preliminary studies suggest these statues were originally placed in a chamber near Djoser's Step Pyramid but were relocated to Wussar F Ra's tomb during later periods.

The team now plans NEWS: OK to investigate why this move occurred.

Additional finds within the tomb complex include:

A three-foot-wide red granite sacrificial table, engraved with a list of ritual offerings.

A 3.8-foot-tall black granite statue of a standing man, inscribed with hieroglyphs. The style and engravings suggest the statue dates back to the 26th Dynasty, indicating that the tomb was reused in the Late Period of ancient Egyptian history.

A secondary entrance on the tomb's eastern front, flanked by two pink granite pillars, also bearing inscriptions and cartouches referencing King Neferirkare, the third king of the Fifth Dynasty.

To the north of the main chamber, archaeologists uncovered a remarkable collection of 13 pink granite statues, seated on high-backed benches.

Among these statues were elevated heads representing the tomb owner's wives, and two headless figures, found near another black granite statue that was unearthed upside down, standing 4.4 feet tall.

Please visit the site: <https://www.newsweek.com/archaeologists-ancient-egyptian-tomb-saqqara-false-door-2070886> [Go there for pix]

ARCHAEOLOGISTS 'DISCOVER' TOMB OF JESUS WITH 'UNBELIEVABLE' EVIDENCE, BY EMILIA RANDALL

The latest findings at the Church of the Holy Sepulchre in Jerusalem align perfectly with the description of Jesus' tomb in the Bible, according to the team

Recent finds at the Church of the Holy Sepulchre in Jerusalem have remarkable parallels to the Bible's depiction of Jesus' burial place.

At the renowned church, architects have pinpointed a site which echoes the Gospel of John's portrayal: "Now in the place where he was crucified there was a garden; and in the garden a new sepulcher, wherein was never man yet laid. There laid they Jesus."

Evidence of ancient olive trees and grapevines has been confirmed by archaeobotanical studies and pollen tests on samples from beneath the centuries-old basilica, indicating a pre-Christian timeline, though radiocarbon dating is still pending.

"We know that the area was already part of the city at the time of Emperor Hadrian when the Romans built Aelia Capitolina," explained Prof. Francesca Romana Stasolla from Rome's Sapienza University to the Times of Israel, citing the Roman metropolis established over Jerusalem's remnants in the early 2nd century CE.

"However, at the time of Jesus, the area was not part of the city yet.", reports the Express.

The belief held by Christians that Jesus' crucifixion and entombment happened where the Church of the Holy Sepulchre now stands, with Calvary or Golgotha as its backdrop, and an aedicule constructed in 1810 marking his grave, continues to endure.

Stasolla has been leading the charge on the ongoing excavations since they kicked off in 2022. The project got the green light in 2019 after years of internal wrangling when the three key religious groups overseeing the church—the Orthodox Patriarchate, the Custody of the Holy Land, and the Armenian Patriarchate—finally agreed to a refurb.

This major facelift included swapping out the old 19th-century flooring, marking the first significant spruce-up of the basilica since it was hit by a blaze back in 1808.

The Israel Antiquities Authority gave the thumbs up for the archaeological work, which is a must-have for any dig on Israeli soil.

"During the renovation works, the religious communities decided to also permit archaeological excavations beneath the floor," Stasolla spilled the beans in her first big chat with The Times of Israel since the diggers moved in.

She went on to say: "However, currently, we do not have any active excavation sites as the church is preparing for Easter, when it needs to be fully accessible to pilgrims."

She underlined that because the spot's super sensitive and there are a ton of logistics to juggle, they've had to be extra careful every step of the way.

The whole archaeology crew comes from Italy and has ties to La Sapienza University. Stasolla shared: "We work in shifts, but our team in Jerusalem always comprises 10 or 12 individuals. The atmosphere here is truly unique; we have received a warm welcome and established strong bonds with everyone."

From time to time, experts in specific fields such as geologists, archaeobotanists, or archaeozoologists from Rome join the archaeological team in Jerusalem. The Church of the Holy Sepulchre was under renovation in March 2025.

"Our team in Jerusalem always consists of 10 or 12 people," Stasolla said. "The atmosphere here is unique; we've been warmly welcomed and have built strong relationships with everyone." Occasionally, specialists like geologists, archaeobotanists, or archaeozoologists from Rome collaborate with the Jerusalem-based archaeological team.

Currently, archaeologists from the Sapienza University of Rome are digging at the Church of the Holy Sepulchre. (Archivio Università di Roma La Sapienza).

"However, most of our team stays in Rome, where we send the data for post-production work," Stasolla further explained.

"While we haven't been able to see the entire church excavated at once, new technologies are helping us reconstruct the bigger picture in our labs," said Stasolla. "If we were talking about a puzzle, we could say we're only excavating one piece at a time, but eventually, we'll have a complete multimedia reconstruction of the full picture."

The Holy Sepulchre has seen its fair share of destruction and restoration over the centuries. The original structure was built in the fourth century by Constantine, the first emperor to convert to Christianity.

It suffered a fire at the hands of Persians in the seventh century and was attacked by caliph al-Hakim in 1009.

Its current form is largely due to extensive restoration during the Crusader rule in the 12th century. Stasolla explains that the hidden layers beneath the church's floor, much like the pages of a book, have provided an extraordinary record of Jerusalem's history, starting with the Iron Age (1200-586 BCE).

"The church is built on a quarry, which isn't surprising as a large part of the Old City of Jerusalem is located on a quarry," Stasolla said. "The quarry was operational during the Iron Age. During our excavation, we found pottery, lamps, and other everyday items from that period."

Before the church was built and after the quarry was no longer in use, part of the site was used for farming.

"Low stone walls were built, and the space between them was filled with soil," Stasolla explained. "The archaeobotanical findings have been particularly interesting for us, given what is mentioned in the Gospel of John, believed to be written or compiled by someone familiar with Jerusalem at the time. The Gospel refers to a green area between the Calvary and the tomb, and we identified these cultivated fields."

Artifacts from the time of Emperor Constantine have been discovered at a Jerusalem site that dates back to the era of Jesus, serving both as a quarry and a burial ground with numerous rock-hewn tombs scattered throughout. "We need to imagine that as the quarry was progressively abandoned, tombs were carved at different levels.

"The area, therefore, featured several burials from that period. Constantine selected the one that had been venerated as the tomb where Jesus was buried, and he excavated around it in the area that corresponds to the current rotunda, isolating it from the other burials."

Within the Church of the Holy Sepulchre complex, there are several ancient tombs, including one believed by many Christians to be the final resting place of Joseph of Arimathea, who is said to have provided his own tomb for Jesus' burial.

Stasolla's excavation team unearthed a variety of items believed to be from the fourth century. Digging beneath the existing structure, she revealed: "Under the current aedicule, we found a circular basis that is part of the first monumentalization of the tomb, made out of marble."

Stasolla highlighted the importance of this find, saying: "It is interesting because the most ancient depictions of the aedicule, which date back to the 5th and 6th centuries, describe it as circular. We therefore believe that this circular basis was part of the original structure built by Constantine."

Future analysis of the artifact, which measures approximately six meters (nearly 20 feet) across, could offer scholars further insights into the rich history of this esteemed structure.

"We are conducting geological analysis to verify the origin of the marble, and we are also testing the mortar," Stasolla said. "Both tests can provide us with crucial information."

Another find that definitively dates back to the fourth century is a collection of coins discovered in the eastern section of the current rotunda. The oldest coin was minted during the reign of Constantius II (337–361 CE), while the most recent ones were issued under Valens (374–378 CE).

The team has also unearthed hundreds of animal bones, evidence of centuries of feasting by priests and pilgrims.

A preliminary report on the excavation, published in the peer-reviewed journal "Liber Annus," in 2023, outlines the contents of a structural trench linked to the Crusader period and a modern manhole pit. Both sites yielded remains of sheep, goats, pigs, chickens, geese, and pigeons, as well as a significant quantity of fish.

Identified species included a ponyfish from the Indo-Pacific Ocean and a cod from the Atlantic.

"We also discovered several shells of a terrestrial snail species that is still consumed today," added Stasolla. "This species originated here and spread around the Mediterranean following the Crusades."

The archaeologist emphasized that only after a thorough analysis of the unearthed bones can we gain a fuller picture of the changing dietary practices of those who lived in and frequented the Church over the ages.

A comprehensive scientific examination of all the findings from the dig, which includes some 100,000 shards of pottery, is expected to span several years. Nonetheless, the digs are set to restart post-Easter and are projected to wrap up within months.

"We only have a part of the northern aisle left to excavate," Stasolla disclosed. When asked whether archaeological efforts could ever conclusively verify Jesus' burial at the Holy Sepulchre, Stasolla highlighted the importance of distinguishing between faith and historical fact.

"However, it is the faith of those who have believed in the sanctity of this site for millennia that has allowed it to exist and evolve," she said. "This is true for all holy sites."

"The real treasure we are discovering is the history of the people who made this site what it is by expressing their faith here," she added. "Whether someone believes or not in the historicity of the Holy Sepulchre, the fact that generations of people did is objective. The history of this place is the history of Jerusalem, and from a certain point, it is the history of the worship of Jesus Christ."

Please visit the site: <https://www.irishstar.com/news/us-news/archaeologists-discover-tomb-jesus-unbelievable-35209539> [Go there for pix]

FORGET MEDALS, ANCIENT GAMES **ATHLETES BATTLED FOR OLIVE OIL,** **BY DAVID PRITCHARD**

The Olympic Games immediately spring to mind when people think about sport in ancient Greece. This is easy to understand because these Games are what has inspired our modern Olympics. The ancient Greeks celebrated their Olympics for a truly staggering 1000 years. Their Games attracted sportsmen from the 1000 Greek microstates of the Mediterranean basin. These Olympics, like ours, were the world's largest event.

Our focus on this four-yearly festival in honour of Zeus, who was the ruler of the gods, is thus perfectly understandable. Yet, what most people do not realise is that the Olympics were only one aspect of sport in ancient Greece. Often overlooked is that these Games were part of a *periodos* or circuit of 4 international sporting festivals. The other 3 Games in this circuit took place at Corinth, Nemea and Delphi. Each of Greece's 1000 microstates also staged their own sporting festivals.

We know of many hundreds of these local Games. Traditional male education also included classes for the events that were common to all Games. Therefore, ancient Greek sport was both a competitive and educational activity. By far, the largest local Games of ancient Greece were the Great Panathenaea. Ancient democratic Athens staged this sporting festival every 4 years in honour of its chief deity, Athena, who was a daughter of Zeus. Local as it was, the Great Panathenaea was, in important ways, as great as the Olympics.

The heyday of both Games was the fourth century BC. During this century, Athens spent an incredible 650 kilograms of silver on each Great Panathenaea. This explains why it actually had twice as many contests as those at the Olympics and lasted twice as long. The Athenians also celebrated their Panathenaic Games for a staggering thousand years.

Yet, there were also three big differences between the Games at Olympia and Athens. The first difference was the prizes. Those at the Olympics were purely symbolic: wreaths of olive leaves. The Athenians, by contrast, handed out storage pots, which were commissioned for each Games. Such an amphora depicted Athena on one side and a sporting event on the other.

Panathenaic amphoras have been discovered right around the Mediterranean basin. This shows that the sportsmen at this festival were as international as those at the Olympics. Beautiful as they are, it is easy to think that these pots were the prizes. But the real prize was what they stored: olive oil.

The Athenians gave victors and placegetters an amazing quantity of such oil. At each Games, they awarded 2100 storage pots as prizes, filling each one with 36 litres. Filling them all would have required more than 75,000 litres of olive oil. What motivated them to dispense so much oil was their myth about how Athena had become their chief goddess. According to this story, she had competed with her uncle, Poseidon, to be their city-protecting deity.

As part of this contest, Poseidon created a salty spring on the Acropolis, while Athena made appear there the world's first olive tree. Because Zeus, understandably, judged such a tree more useful than undrinkable water, Athena was declared the winner.

The Olympics and the Great Panathenaea included the common events of ancient Greek sport. There was a stadion or sprint race as well as 3 or 4 other footraces. Sportsmen could compete in wrestling, boxing and the pankration, which was like our kickboxing. The pentathlon at both had the same 5 events: stadion, javelin, long jump, discus and wrestling. The two festivals had the full suite of races for horse-drawn chariots, racehorses and mule carts.

But events also represented the second big difference between these two Games. Two events at the Great Panathenaea were completely unique. The first was a race for a charioteer and a passenger, which was called the apobates. This contest required the passenger, who was armed as a soldier, to jump on and off a speeding chariot.

The second unique event was the purrhikhe, which was a dancing contest. Each troupe in this contest carried spears and shields. We used to think that the Great Panathenaea was a birthday party for this goddess. But it is now clear that the Athenians had a different origins-story for their Games.

This myth accounts for these two unique events that it had. When Zeus became the ruler of the gods, he was forced to fight the Giants, who were an earlier generation of unruly gods. In doing so, he relied on Athena, who was the best of his warriors, to lead the Olympian gods in the battle. The story explained that the Great Panathenaea started as the celebration of the victory to which Athena had led them. She had done so by fighting as a soldier, who had jumped on and off a chariot.

Consequently, the apobates race saw mounted soldiers mimic how their cherished goddess had once fought. The purrhikhe was the spontaneous dance that Athena invented in celebration of her smashing victory. It was this that she was always depicted dancing on Panathenaic amphoras.

Sport and war were closely linked together in ancient Greece. The Great Panathenaea had many contests for members of the cavalry-corps. There were also team events for the Athenian armed forces. The anthippasia saw cavalry-units charge each other. There was also a race of warships and a team event in euandria or manly courage. War was also put on display in the pompe or procession of the Great Panathenaea, which was depicted on the Parthenon frieze. It included cavalymen and soldiers in their thousands, with hundreds more bearing weapons as gifts for Athena.

The Athenians boldly asserted that they were the children of Athena. Like their divine mother, they were the best warriors, who, with her help, would always be victorious

Please visit the site: <https://www.uq.edu.au/news/article/2025/05/forget-medals-ancient-games-athletes-battled-olive-oil>

BRONZE AGE LEPROSY HITCHED RIDES ALONG ANCIENT COPPER AND POTTERY TRADE ROUTE, BY CHRISTA LESTÉ-LASSERRE

4000-year-old scarred jaws in Oman hub mark oldest cases outside South Asia.

More than 2000 years before the Silk Roads, traders and travelers in the third millennium B.C.E. were already bustling across a vast trade network that spanned from southern Arabia to the tip of South Asia. They brought home spices, precious metals, and pottery, as well as something they hadn't bargained for: leprosy.

Despite being a phenomenally difficult disease to catch—contrary to popular belief—the ailment disfigured at least a dozen people more than 4000 years ago at a copper-working site in northern Oman. The findings mark the pathogen's earliest known evidence outside South Asia—and hint that it may have been unexpectedly widespread along this early trade network, researchers reported on 31 March in *Frontiers in Medicine*.

Leprosy is a chronic bacterial infection that progressively damages nerves, skin, and finally bone. The disease spreads through droplets and can lie dormant for years, making ancient trade routes an ideal conduit, says environmental historian Eric Strahorn at Florida Gulf Coast University, who was not involved in the study. “The idea that sailors could have brought it on a crowded boat with them, or that merchants traveled from the Indus Valley towards Oman and spread it?” he says. “Yeah, that makes a lot of sense.”

In 1999, Gwen Robbins Schug, now a bioarchaeologist at the University of North Carolina at Greensboro, was visiting India as a master's student with her academic adviser when she was unexpectedly invited to reassemble an ancient skeleton at Balathal—a rural outpost just off a main trade route—after someone had mysteriously reburied the bones overnight. That led to a return visit 2 years later to study the rest of the site's remains, including a 4000-year-old skeleton with an eroded nose hole, a vividly shrunken jaw, and a shinbone streaked with ridges—ultimately revealed as the world's oldest physical evidence of leprosy. A few years later, she and her colleagues found similar bone damage in eight people buried 770 kilometers away at Harappa in Pakistan.

The findings made Schug wonder: Had the leprosy bug been hitching rides with Bronze Age traders?

When Kim Williams, an archaeologist at Temple University, invited Schug to join a dig in Oman in 2018, Schug jumped at the chance. Williams had been excavating a Bronze Age metal-crafting site in the foothills of Oman's copper-rich Al-Hajar Mountains. The site, Dahwa, was strewn with red and black pottery shards from the Indus Valley—clear evidence that its residents, the Umm an-Nar people, were trading their copper for South Asian goods 4000 years ago.

At the heart of the site, elevated on hand-built mounds, loomed two monumental circular tombs that lay untouched for thousands of years. There, Schug and her colleagues sifted

through 180,000 bone fragments in search of leprosy and found more than 100 that warranted a closer look.

Back home at their North Carolina lab, Schug and her colleagues cleaned up a few dozen jawbone fragments and analyzed them for telltale signs of facial leprosy: a worn-down nose bone, rounded edges around the nose hole, a pitted or deformed palate due to infection, and bone loss following tooth loss. Twelve individuals had clear signatures of the disease, Schug says.

“I definitely knew it when I saw it—even when it was still covered in dirt,” she recalls.

Still, the team wanted to be certain it wasn’t just seeing the effects of bones getting jumbled about, as the Umm an-Nar people reused their tombs. So they took the three most complete jaws and scanned them using micro-computerized tomography (micro-CT)—the first time the high-resolution 3D imaging technique has been used to find leprosy.

Micro-CT also revealed finer details, such as subsurface damage in the bone—which suggested the lesions indeed came from leprosy, not from postmortem jostling. Schug says the bones, dated to between 2500 and 2000 B.C.E. using radiocarbon analysis of charcoal from nearby buildings and bone mineral from the tomb, represent the oldest confirmed cases of leprosy outside of South Asia.

The sheer number of cases at the site is surprising, she adds. For all its hype and stigma, leprosy only actually infects 5% of the people exposed to it. And among those, only 20% go on to develop the disease. That suggests Bronze Age trade routes may have been crawling with the pathogen, she notes.

One potential reason for leprosy’s Bronze Age prevalence is an ancient climate shift: As drought and shifting rainfall patterns dried up crops and water sources, people crowded into growing cities and traveled farther for trade. Those conditions would have turned traders into a walking buffet for pathogens, says Charlotte Roberts, a bioarchaeologist at Durham University. “That was probably some really hard work along long, hard routes, carrying lots of stuff in very hot weather, and probably not eating and sleeping as well as they normally would,” she says.

Studying ancient DNA from the pathogens might also reveal whether leprosy was more contagious back then—more like its cousin tuberculosis today—compared with more recent strains, Schug says.

For Samuel Mark, a paleopathologist at Texas A&M University, such DNA work should first definitively distinguish leprosy as the culprit rather than tuberculosis, syphilis, leishmaniasis, or even cancer. “While rarer, these same features can be produced by other conditions,” he says.

Schug, however, isn’t concerned. She’s convinced the ongoing ancient DNA testing will confirm what the physical evidence already reveals. “Micro-CT lets us see what the eye can’t—subtle, patterned damage across multiple faces,” she says. “When that damage fits [the] key signs of leprosy, the diagnosis becomes very clear.

Please visit the site: <https://www.science.org/content/article/bronze-age-leprosy-hitched-rides-along-ancient-copper-and-pottery-trade-route> [Go there for pix]

HOW YALE UNIVERSITY'S 4,000-YEAR-OLD BABYLONIAN TABLETS UNVEILED THE WORLD'S OLDEST RECIPES

Gojko Barjamovic not only deciphered the ancient recipes but also attempted to recreate some of the dishes described in them.

Gojko Barjamovic, a lecturer at Yale University, along with a team from Harvard, deciphered and even attempted to recreate some of the dishes detailed on Babylonian clay tablets dating back nearly 4,000 years.

For decades, these tablets puzzled archaeologists. Written in cuneiform script, they were long thought to contain medicinal formulas or rituals. However, thanks to the efforts of Barjamovic and his colleagues, it is now understood that these ancient texts are some of the oldest known written recipes. "Cooking is one of those silent technologies that was traditionally passed on informally, especially among women. That is why archaeologists long doubted the possibility of such written artifacts existing," explained Barjamovic, according to LaRepubblica.pe.

The discovery of these tablets revealed that cooking was an art passed down orally for much of history, with the Mesopotamian cookbook representing a rare instance of written documentation, according to LaRepubblica.pe. Many of the dishes feature ingredients still common in modern Iraqi cuisine, such as cilantro and garlic, demonstrating continuity in the Mesopotamian gastronomic tradition.

Please visit the site: <https://www.jpost.com/archaeology/archaeology-around-the-world/article-853470> [Go there for pict]

KARATEPE ASLANTAS INSCRIPTIONS **ENTER UNESCO MEMORY OF WORLD** **REGISTER**

Inscriptions featuring both Anatolian and Phoenician languages at Karatepe Aslantas Open-Air Museum — Türkiye's first open-air museum — in Osmaniye

The ancient bilingual inscriptions of Karatepe Aslantas Open-Air Museum in Osmaniye, Türkiye, have been officially inscribed into the UNESCO Memory of the World International Register.

These inscriptions, written in both Anatolian Hieroglyphic and Phoenician scripts, highlight one of the earliest known examples of bilingual writing in the ancient Near East and provide invaluable insights into the linguistic and cultural landscape of the first millennium B.C.

A landmark for cultural preservation

Governor Erdinc Yilmaz, speaking at the Karatepe Aslantas Open-Air Museum, expressed his pride in the international recognition of the site's inscriptions, stating: "We are delighted with the result of this collaborative effort. The decision taken at the UNESCO Executive Board meeting in Paris confirms the global importance of the Karatepe inscriptions."

Yilmaz reminded that the museum is already listed on UNESCO's Tentative List of World Heritage Sites and noted the added value that the inscriptions' inclusion in the Memory of the World Register brings to cultural preservation efforts in the region.

Collaborative research led to global recognition

The successful registration followed a joint initiative by the Osmaniye Directorate of Culture and Tourism, Osmaniye Korkut Ata University, and the Global Strategic Research Association. Their efforts focused on documenting, interpreting, and promoting the historical value of the bilingual texts.

The collaboration underlined the significance of the inscriptions not just as historical artifacts, but also as instruments of intercultural communication that reflect the ancient dynamics of Anatolia and the Eastern Mediterranean.

A boost for tourism and cultural heritage

Yilmaz emphasized the impact of the inscription on tourism and heritage preservation:

"Osmaniye is home to many ancient settlements and cultural treasures. This recognition is not only a major step in safeguarding our heritage but also in promoting it to global audiences."

Mustafa Cakar, head of the Global Strategic Research Association, also highlighted the decision's broader impact, stating that the listing will “significantly contribute to the international promotion of the inscriptions and integrate them into global cultural heritage narratives.”

Please visit the site: <https://www.turkiyetoday.com/culture/karatepe-aslantas-inscriptions-enter-unesco-memory-of-the-world-register-3201144> [Go there for pix]

VESUVIUS CHALLENGE: AI UNLOCKS TEXT OF BURNED PHILOSOPHICAL TREATISE PAPYRUS

The scroll named PHerc. 172, one of three from Herculaneum housed at the Bodleian Libraries in Oxford, was scanned last July.

A charred scroll recovered from a Roman villa buried under ash during the eruption of Mount Vesuvius in 79 CE was identified as a work by the ancient Greek philosopher Philodemus. Researchers discovered the title and author of the Herculaneum papyrus after scanning it with X-rays that digitally unwrapped the sheets, revealing details for the first time using this method.

The text is part of a multi-volume work titled *On Evil*, written by Philodemus, an Epicurean philosopher of the first century BCE. The scroll contains traces of ink that reveal the ancient Greek word for "disgust" at least twice, providing insights into the content of the work.

The papyrus is one of three from Herculaneum housed at the Bodleian Libraries in Oxford. It was scanned last July at Diamond Light Source, the UK's national synchrotron facility in Oxfordshire. Unusually, some ink was visible in the X-ray images of the scroll, which allowed researchers to identify the text.

"It's the first scroll where the ink could just be seen on the scan," said Dr. Michael McOskey, a papyrologist at University College London. "Nobody knew what it was about. We didn't even know if it had writing on," he added in comments reported by The Guardian.

The scroll is among hundreds found in the library of a Roman villa thought to have been owned by Julius Caesar's father-in-law. The villa was buried under tons of ash and pumice when the city of Herculaneum, along with Pompeii, was destroyed by the eruption of Vesuvius.

Excavations in the 18th century recovered many of the ancient papyri, most of which are held at the National Library of Naples. The documents are so badly burnt that they crumble when researchers try to unroll them, and the ink is unreadable on the carbonized papyrus. Although most papyri were preserved only as charred fragments, new technologies now allow for non-destructive reading of their content.

The latest work builds on earlier breakthroughs from the Vesuvius Challenge, a global competition launched in 2023 that offers cash prizes for progress in reading the scrolls using three-dimensional X-rays. Sean Johnson, as part of the Vesuvius Challenge, and separately Marcel Roth and Mika Novak at the University of Würzburg, identified the title and author of the text in the innermost section of the scroll. This research won the first prize of \$60,000 (£45,200) in the competition.

In addition to On Evil and Philodemus, an "A" that appears on the scroll may indicate that it is the first part of the work. On Evil includes at least ten volumes covering topics such as arrogance, greed, flattery, and household management.

Dr. Brent Seales, a computer scientist at the University of Kentucky who co-founded the Vesuvius Challenge, stated, "We see ink samples in many of the new papyri we have scanned, but we have not yet turned them into coherent text." He explained, "That's our current bottleneck: converting the massive scan data into organized sections that are properly segmented, virtually flattened, and enhanced so that the evidence of ink can then be interpreted as actual text."

Research activity is accelerating, with eighteen scrolls scanned at Diamond in March, and another twenty being analyzed this week at the European Synchrotron Radiation Facility in Grenoble. Soon, experts hope to know much more about the papyri.

"The pace is ramping up very quickly," said Dr. McOsker. "All of the technological progress that's been made on this has been in the last three to five years and on the timescales of classicists, that's unbelievable," he concluded. "Everything we're getting from the Herculaneum library is new to us."

Although traces of ink were identified in many new scrolls, scientists emphasize that converting these data into coherent texts remains a challenge. The development of artificial intelligence software and algorithms has been instrumental in making progress. Last year, a team of students with computer science knowledge shared the grand prize of \$700,000 in the Vesuvius Challenge for developing AI software that allowed them to read 2,000 ancient Greek letters from another scroll.

The discovery of the scroll was made as part of an international collaboration involving University College London, the University of Oxford, and the Bodleian Libraries. The scientific approach of using X-ray scanning to extract details from ancient papyrus is being used successfully, enabling scholars to uncover lost works of antiquity without causing further damage to the fragile materials.

Please visit the site: <https://www.ipost.com/archaeology/archaeology-around-the-world/article-852823> [See also <https://greekreporter.com/2025/05/06/lost-work-greek-philosopher-philodemus-unearthed-herculaneum-scroll/>]

THE MINOAN IVORY SCEPTER: THE LONGEST LINEAR A INSCRIPTION, BY DIMITRIOS ARISTOPOULOS

In 2024, archaeologists uncovered a remarkable artifact in the Anetaki area of Knossos, located in Crete, Greece: an ivory scepter bearing the longest known inscription in the Linear A script. The principal investigators were Athanasia Kanta, Dimitri Nakassis, Thomas G. Palaima and Massimo Perna.

This item is not only of artistic and ceremonial importance, but also a key to understanding the enigmatic Minoan civilization. Linear A script is the still-undeciphered writing system used by the Minoans during the Neopalatial period (c. 1700–1450 BCE). The discovery of this scepter has opened up new avenues for the study of Minoan administration, religion, and the complex role of writing in their society.

Artistic and ceremonial significance

The scepter is a finely crafted object, with an elongated handle and a circular head, both adorned with intricate Linear A inscriptions. The head of the scepter contains twelve square panels, each decorated with a four-legged animal. This could be a symbolic or ritualistic motif, possibly representing offerings or sacred imagery. The presence of these animals suggests that the scepter played an important ceremonial role. It may have been associated with religious or state functions.

The inscription spans the entire length of the handle and the circular head, containing about 119 symbols. This makes it the most extensive example of Linear A discovered so far. The signs consist of a mixture of logograms and syllabic characters. This indicates the script's complex nature, which combined both phonetic and ideographic elements. The exact meaning of the inscriptions remains unclear. However, they seem to serve both administrative and ritualistic functions. This reinforces the idea that Minoan writing was deeply intertwined with the religious and political life of the time.

Context and discovery

This scepter was found in the “Fetish Shrine” at the Anetaki site, a building identified as a religious or ceremonial center. The shrine contains two connected rooms and a central antechamber, suggesting that the scepter was not merely an object of artistic craftsmanship, but an item of significant ritual importance.

The discovery of the scepter within a religious context implies that a high-ranking official or priest likely used it. It may have served as a symbol of authority or divine favor. Furthermore, the role of such objects in Minoan society speaks to a culture where religious practices were intricately tied to governance. The implication is that in this society the elites wielded both spiritual and political power.

Insights into Minoan writing and governance

The discovery of the Minoan ivory scepter is a significant breakthrough in the study of the Linear A script. Despite numerous attempts, Linear A remains largely undeciphered. Scholars still debate its connection to other ancient scripts, especially Linear B. The inscriptions on the scepter feature both ritualistic imagery and administrative symbols. These provide an invaluable opportunity to explore the role of writing in Minoan Crete. The numerical signs found on the handle stand in contrast to the lack of numerals in the ritual sections. This difference highlights the potential dual purpose of writing in Minoan society: as a tool for governance and as a vehicle for religious expression.

By analyzing these inscriptions alongside other Linear A texts, researchers might uncover new insights into the structure of the script. This could lead to a better understanding of its role in Minoan life and culture. The scepter's inscriptions offer a glimpse into the complexity of Minoan society, particularly in terms of administration and ritual.

The Minoan ivory scepter, with its extensive Linear A inscription, provides a rare look into the ceremonial and administrative practices of this ancient civilization. While the exact meaning of the inscription remains elusive, the scepter stands as a testament to the intricate nature of Minoan writing, religion, and political organization. At the same time, as scholars continue their work, the scepter may hold the key to unlocking more mysteries of the Minoan world. This discovery brings us closer to understanding the sophisticated society that once flourished on the island of Crete.

Please visit the site: <https://greekreporter.com/2025/04/28/minoan-ivory-scepter-longest-linear-a-inscription/> [Go there for pict]

NEW DISCOVERIES IN THE PAN GROTTO IN PANEAS, BY ADI ERLICH AND RON LAVI

Travelers who visit the springs of Paneas in the Hermon Stream Nature Reserve in Northern Israel, at the foot of Mt. Hermon, are amazed by the cliff, water, and forest scenery. However, the most impressive feature of that landscape is a big natural cave on the cliff, which, during the Hellenistic and Roman periods, was associated with the cult of Pan, the god of the wild and shepherds.

The name of the place, Paneas or Paneion (today after the Arabic: Banyas), is named after this cult. During the Hellenistic period, this cult place was initiated. According to Josephus Flavius, Herod the Great built a temple there to his benefactor, Augustus, near the cave. According to his account, the cave was full of water:

“Herod there too dedicated to him (Augustus) a temple of white marble near the sources of the Jordan, at a place called Paneion. At this spot a mountain rears its summit to an immense height aloft; at the base of the cliff is an opening into an overgrown cavern; within this, plunging down to an immeasurable depth, is a yawning chasm, enclosing a volume of still water, the bottom of which no sounding-line has been found long enough to reach.”

Jewish War 1.404-406

Today the cave is usually dry, only filling up occasionally during rainy times.

Herod's son, Philip, erected a new city called Caesarea (Philippi) at Paneas. Philip's nephew, Agrippa I, inherited his uncle's territories, including Caesarea Philippi, but it was his son, Agrippa II, who turned it back into the capital of his kingdom. After Agrippa's death toward the end of the 1st century C.E., Caesarea Philippi was transferred to the province of Syria.

Zvi Ma'oz excavated the terrace at the foot of the cliff on behalf of the Israel Antiquities Authority in the 1990s. He discovered a series of shrines, temples, and courtyards that developed on the terrace throughout the Roman period. He left the Pan cave almost unexcavated, except for boulders taken out of the cave, and a niche wall west of its forepart. Ma'oz maintained that this wall — with alternating five square and rounded niches — was the wall of the Augustus temple built by Herod, the cave being its rear part and the holy of the holies. Thus, the sign for visitors in the nature reserve reconstructed a white Roman temple in front of the cave, hiding it from the visitors approaching the site.

In the past decade, this niche wall has started to collapse, and to support it and allow for its conservation, we were invited by the Israel Nature and Parks Authority to conduct a dig on behalf of the Zinman Institute of Archaeology at the University of Haifa. What started as a small salvage dig developed into a three-year project in the years 2019-2021, during COVID-19, which was full of surprises. Today, we can tell that there was no temple in front of the cave, and throughout the Roman period, the cave with its deep pool was visible to the eye and was a prominent feature of the local landscape, as it is today.

The first feature that was built at the place was a large underground aqueduct with a gabled roof, which drained water from the cave southward, and was exposed for a length of 22.5 meters (Fig. 4B, Fig. 5). The aqueduct kept the water in the cave to a level that would not flood the complex, and it kept the tip of a massive rock at the center of the cave, which is still visible today (see Fig. 2 and Fig. 4A), exposed at all times. Over the aqueduct, the courtyard was built: it was composed of two niche walls on the west and east, of the latter only one niche survived (Fig. 6, Fig. 4D), a small pool at the center in front of the cave (Fig. 4C), and a strip between the cave and the small pool, separated from the main hall by small columns and flanked by two square niches. Small water installations and channels were built near the pool. Not much was left of the floor, which was made of stone slabs laid on gray cement.

This courtyard in front of a cave full of water and flanked by niche walls was constructed in the last third of the 1st century CE, according to archaeological evidence (coins, pottery, and the radiometric date of the aqueduct's plaster). Thus, we attribute it to Agrippa II, the last king of the Herodian dynasty. According to Flavius Josephus, Caesarea-Philippi was Agrippa's favorite city, which he embellished. After the Romans suppressed the Jewish revolt in 70 CE, he invited Titus and his troops to watch games in which Jewish prisoners were executed (Jewish War, 7: 23–24, 37–38). Later on, Agrippa II, who spent his early life in Rome, returned to Rome with his sister, Queen Berenice, where he was awarded the *ornamenta praetoria* (clothing and social privileges of a praetor of a senatorial order), as recognition for his contribution to the victory of the Romans over the Jews (Cassius Dio, Roman History, 66.15.3–4).

Agrippa's upbringing in Rome is essential for understanding the architecture of the complex at Paneas. It is shaped as a standard feature of that time in Rome and Italy: Triclinium–Nymphaeum in front of a grotto, for dining and entertainment in an imposing scenery. There are a few examples of such complexes with a natural or artificial cave dating to the Early Empire, like the one at Baia near Naples or at Castelgandolfo south of Rome, but the closest parallel is the Imperial triclinium–Nymphaeum at Sperlonga, on the coast halfway between Rome and Naples, known as Tiberius' villa (although it was erected before his time). Sperlonga combined wild and tame elements: the sea, fishponds, a triclinium, an impressive grotto on a cliff, and sculptural groups. The resemblance between the complexes of Sperlonga and Paneas is striking. It seems that Agrippa II, who grew up at the emperors' courts and knew these Italian lavish triclinia, wished to build for himself a little Italy in the Levant.

After Agrippa's death, by the end of the 1st century CE, Paneas was incorporated into the province of Syria. The courtyard returned to its original use, as an open cult place, probably to the god Pan. From this phase, we have plenty of marble slabs, nicely modeled cornices on the big niches (Fig. 9), and altars along the western niche wall. One of the altars, which was found embedded in a later wall and its precise origin is obscure, carried an inscription to Pan-Zeus Heliopolitanes, dedicated by a worshipper from Antioch (Fig. 10). The massive rock in the cave likely carried a statue of the god, as shown in some of the coins of Caesarea Philippi (Fig. 11). Alternatively, it held an altar that seemed to be floating on the water, like in Syrian sacred pools, such the Hellenistic temple at Amrith, or the Roman cult place at Hierapolis described by Lucian (*de Syria Dea*, 45–47).

Eusebius tells about rituals of divination that took place at Paneas in the late 3rd or early 4th century CE, where a sacrifice would be thrown into the water, and if rejected by the god, it would appear further down the springs (Ecclesiastical History, 7.17). Similar ceremonies of hydromancy, i.e., divination by water, also took place in the cult place at Afqa in Lebanon, east of Byblos, as described by Zosimus (New History 1.58). Afqa resembles Paneas greatly (Fig. 12). Thus, the cult in front of the Paneas cave and its pool probably involved different rituals such as the Pan cult, hydromancy, and perhaps more.

In sum, the Paneas cave witnessed changes in function and its modeling, from the cultic to the royal and back to cultic, and from a wild place to a built complex. It has been, and still is, a significant feature in the local landscape. Today, some of its secrets are revealed.

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Their article, “Dine and Worship: The Roman Complex in Front of the Pan Grotto in Paneas/Caesarea Philippi” recently appeared in the journal BASOR.

Excavations at Paneas were undertaken on behalf of the Zinman Institute of Archaeology.

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Please visit the site: <https://anetoday.org/pan-grotto-paneas/> [Go there for lots of pix & figs]
