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**Good means not merely not to do wrong, but
rather not to desire to do wrong. (Democritus)**

Newsletter of the Hellenic Society of Archaeometry

- April 2023 -

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ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

2ND WORLD OF IRON CONFERENCE, BRITISH INSTITUTE IN EASTERN AFRICA, 6-10TH NOVEMBER 2023, NAIROBI, KENYA

Dear all,

We are happy to announce that the second *World of Iron* conference will be held at the British Institute in Eastern Africa in Nairobi, Kenya, from 6-10th November 2023.

With morning sessions dedicated to the presentation of the latest research from around the world, and afternoons dedicated to forward-looking discussions, this agenda-setting conference will synthesise the latest high-quality multi-disciplinary research on iron. It will create a globally comparative perspective and integrate insights gained from established and emerging research methods. Each day focuses on a particular theme: Invention, innovation and theoretical frameworks; Scales of production and exchange; Methodological approaches; Environmental impact; and Engagement, where we will consider ethical, innovative and appropriate interactions and communication with communities from school children to billion-dollar mining companies.

By reflecting on how far we have come, we will collectively identify key research priorities to move our practice forwards as we continue through the next decade.

Full and partial travel support is available in some instances thanks to support from The British Academy and the Leventis Foundation.

Further details, including information on registration, abstract submission and travel support, will be available soon at www.biea.ac.uk/iron.

Please circulate this announcement across your networks.

We hope to see many of you in Nairobi!

Best wishes,

Jane Humphris, Thilo Rehren and the Scientific Committee

IRUG15 CONFERENCE & WORKSHOP, 26 - 29 SEPTEMBER 2023, TOKYO, JAPAN

The [Tokyo University of the Arts](#) (Geidai), [Tokyo National Research Institute for Cultural Properties](#) (Tobunken), and Infrared and Raman Users Group (IRUG) are excited to confirm the **15th IRUG International Conference (and Workshop on Reflectance Infrared Spectroscopy)** on **26 - 29 September 2023, in Tokyo, Japan**.

We are delighted to announce that **Dr. James A. de Haseth** will be presenting a keynote lecture covering aspects of the theory and challenges of reflectance mode infrared spectroscopy. Dr. de Haseth is an Emeritus Professor of Chemistry at the University of Georgia and co-author of the classic reference *Fourier Transform Infrared Spectrometry*. The IRUG15 conference will be held from Tuesday morning to Friday afternoon, 26 - 29 September, interspersed by the **workshop**, focusing on **reflectance infrared data acquisition, processing, and interpretation**, on Wednesday, **27 September**. **Dr. Marcello Picollo**, Senior Researcher, IFAC-CNR, Italy, will lead the workshop, Workshop participants will be limited to 15 by application (see Workshop Registration Form). Delegates not attending the workshop will be free to explore the delights of the great city of Tokyo on that day.

Visits to the studios and laboratories at Geidai and Tobunken and local museums, such as the Tokyo National Museum and Museum of Western Art will be offered to delegates as part of the conference activities. Logistical information, hotel suggestions, etc., will be posted shortly.

It would not be possible to organize IRUG15 without modest attendance fees. These have been set at **US\$200** (early bird **US\$150**) for professionals and **US\$50** (**US\$40** early bird) for full-time students, and an additional **US\$50** for attending the workshop. If the registration fee is a serious barrier to your attendance, please write us, and we will investigate if a discount or remission may be applied in your circumstance. Attendance at the conference will be limited to 100 delegates and the workshop will be limited to 15 participants.

If you would like to present a paper or poster at the conference or are just keen to attend, please drop us a line at IRUG15@ml.geidai.ac.jp and complete the registration. Papers and posters are invited on **all aspects of IR and Raman spectroscopies and their application to the study of cultural heritage**. Submissions on **reflectance mode** or **ATR** techniques, and work on **Asian cultural heritage**, are particularly encouraged. Abstracts (preferably in Word, of up to 1000 words or so) should be sent to us at the IRUG15 email.

The abstract submission deadline has been extended to 15 April, just 4 weeks away!

Given the impact of the financial crisis on many cultural heritage institutions, we will be accepting a small number of papers for virtual presentation (with a live Q&A session with all speakers, whether physically or virtually present, following the presentations).

We look forward to welcoming you to the conference in September!

Masahiko Tsukada (Professor of Conservation Science, Tokyo University of the Arts)
and Boris Pretzel (former Head of Science, Victoria and Albert Museum - retired)

IRUG15 Organizers
IRUG15@ml.geidai.ac.jp

RAA2023–ABSTRACT SUBMISSION: NEW DEADLINE

Dear Raman Enthusiasts!

The deadline for abstract submission to the 11th International Conference on the Application of Raman Spectroscopy in Art and Archaeology (RAA2023) has been **extended to Monday, April 10, 2023**.

Find below the new important dates:

Abstract Submission Deadline: ~~19 March 2023~~ **Extended Deadline 10 April 2023**
Notification to the Authors: ~~Before 30 April 2023~~ **Before 26 May 2023**

The abstracts must exclusively be submitted via the online system of the RAA2023 web page [|RAA 2023 \(ugent.be\)](http://RAA2023.ugent.be). Any other means of submission will not be accepted.

For any questions regarding the abstract(s) submission, 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

THE CONNECTED PAST, THEME: 'DIGITAL METHODS FOR STUDYING NETWORKS AND COMPLEXITY IN THE HUMANITIES', HELSINKI, 12-15 SEPTEMBER 2023, CALL FOR PAPERS

The last decade has seen an explosion in the application of digital methods in the humanities from LiDAR scanning of archaeological features, 3D models for visualizing artefacts, to network science applications for exploring interaction and mobility, and even textual data. Despite many cross-disciplinary successes, the reality remains that many of these new tools of analysis are borrowed from other disciplines - computer science, sociology, physics, and/or ecology – highlighting the need for building cross-disciplinary bridges. This is especially true for historians and archaeologists working diachronically across large geographic areas and time periods, with incomplete and fragmentary data requiring thinking outside the box. This conference aims to do just that, with a focus on recent and current work conducted on the east Mediterranean and the ancient Near East.

By bringing together scholars from a wide range of fields and academic disciplines, our goal is to engage in friendly and informal dialogue on the application of digital methods for studying networks and complexity in past societies. In addition to the two days of talks, we also offer a series of hands-on workshops in the two days leading up to the conference, through which you can further develop your skills and broaden your digital horizons.

Although our focus is on the eastern Mediterranean and the ancient Near East, we welcome any contribution that discuss, address, and/or explore historical and archaeological networks from a wide range of digital perspectives. What new approaches or tools have you been using to explore your data and what collaborations (if any) did you find most fruitful in this goal?

Contributions can include, but are not limited to:

- New digital methods or tools for studying historical, archaeological, or lexical datasets
- Modelling - spatial, statistical, material datasets
- Geospatial analysis, methods, and applications
- Exploring trade routes, mobility, interaction, migration of people, things and ideas
- Integration of spatial and material datasets
- Diachronic, multi-scalar analyses using digital methods
- Traditional SNA applied to historical datasets
- Agent Based Modelling (ABM)
- Digital materiality
- Text mining and analysis
- Novel visualization methods and analysis of datasets
- Digital methods and community archaeology/heritage management in the Middle East
- ANE imperial dynamics and social networks

Please submit your abstract (max. 300 words) to ConnectedPastHelsinki@gmail.com by 16 April 2023. Unsure if your paper topic would be a good fit? Send us an email, and we will be happy to clarify.

Connected Past 2023 is hosted by the Centre of Excellence in Ancient Near Eastern Empires (ANEE) and will take place at the University of Helsinki from 12-15 September. Conference registration will open in May, with more detailed information on offered workshops. We endeavour to provide fair and accessible registration fees. Registration costs will range from 25-50 euros (concessionary, regular).

Organising committee: Paula Gheorghide (ANEE), Lena Tambs (ANEE) and Jason Silverman (ANEE).

For updates and more information, see <https://connectedpast.net/other-events/helsinki-2023/>.

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ – **JOB VACANCIES/FELLOWSHIPS**

RI FREER PRIZE FELLOWSHIPS

About the Ri and Philip Freer: Founded in 1799, the Ri is a world-famous independent charity dedicated to enhancing public understanding of science and the role of science in society. Among its many luminaries, the analytical chemist and pioneer of modern experimental physics, Michael Faraday, is the most famous. Philip Freer was a collateral descendant of Faraday and a great philanthropist who established the Philip Freer Trust to support postgraduate students to “make a difference in the world”.

Type of award: Prize Fellowship for doctoral candidates in their unfunded writing-up year.

Areas of research supported: history of science and technology; heritage conservation science; history of the Royal Institution.

Stipend: £18,000 (the Fellowship will pay maintenance but not fees).

Duration of Fellowship: 12 months (commencing 1 October 2023).

Application materials:

- Personal details
- CV (no more than 2 sides)
- General interest pitch of the applicant’s doctoral research (750 words)
- Introduction to yourself and your research (short film of no more than 3 minutes and should be submitted in the form of a video link)
- Thesis summary (no more than 500 words)
- Names and contact details for 2 referees including PhD supervisor (referees will only be contacted at short-list stage).

Eligibility: At the point of taking up the award, applicants must be registered for graduate study at their home institution (and so have access to institutional resources).

How to apply:

Please follow this link to upload application materials.

All written application materials should be in PDF format and all files must be clearly labelled to include name of applicant and type of document.

For more information on the application materials please refer to the Criteria for Assessment guidance on here.

If you are unsure of how to submit a video link please follow the following guide on how to do so:

How to upload onto YouTube from Google

How to upload on to YouTube using your phone How to upload your video from Wix

Any queries should be directed to Freer Administrator Hannah Pratt h.pratt@ri.ac.uk

Deadline for applications: Friday 7th April 2023 midnight

Ri Freer Prize Fellowship purpose: The Ri Freer Prize Fellowships are intended as writing-up awards for doctoral candidates researching the history of science; history of the Royal Institution; or heritage conservation science. Ri Freer Prize Fellowships are awarded based on candidates' ability to identify and communicate the significance and potential of their research in a compelling way that can engage a general interest audience. For further details see the Criteria for Assessment.

Ri Freer Prize Fellow support: Ri Freer Prize Fellows will benefit from significant opportunities to promote their research on Ri platforms, and to establish valuable new contacts and collaborations in academia, industry, heritage, policy, charity and media sectors. There will also be opportunities to engage with the Ri's public lecture programmes, archive, masterclasses and education programmes. Any Freer Prize Fellowship winners will also be introduced to the Ri's network and receive training for professional development.

Ri Freer Prize Fellow commitments: Ri Freer Prize Fellows will commit to a number of general interest outputs to promote their research. The precise nature of these outputs will be decided in discussion with the Ri but will include short films; tours for visitors to Ri collections; and blogs. Ri Freer Prize Fellows will be supported to produce these outputs and where appropriate link their work to Ri collections and heritage as part of research promotion. Ri Freer Prize Fellows are not required to live in London but will be expected to attend key events.

Application Process:

Applications will be reviewed by a panel of experts in the specified subject areas. There will be no interview.

Referees are only contacted at the short-listing stage.

2 Ri Freer Prize Fellows will be announced by 30 July 2023.

All queries should be directed to Freer Administrator Hannah Pratt - hpratt@ri.ac.uk

POSTDOCTORAL POSITION AT THE YALE INSTITUTE FOR THE PRESERVATION OF CULTURAL HERITAGE

The Technical Studies Laboratory of the Yale Institute for the Preservation of Cultural Heritage (IPCH) is seeking applicants for a one-year position at the postdoctoral or postgraduate associate level, supported by a grant from the Avangrid Foundation. *This description is for postdoctoral-level applicants.*

Postdoctoral Position Combining Interdisciplinary Research and Museum Program Development on Assyrian Stone Reliefs

The postdoctoral associate will carry out a project with two overlapping objectives: research on the polychrome color schema of Assyrian stone reliefs and developing educational materials about polychromy and pigment analysis for use by the Yale Peabody Museum in gallery interpretation and programming.

The Yale Peabody Museum is currently undergoing a transformative renovation, which includes the creation of new spaces dedicated to ancient Mesopotamia. The gallery will feature two relief fragments from the palace of Ashurnasirpal II. Long deprived of their original painted surfaces, the reliefs will have that history of color restored through dynamic light projection to simulate how the reliefs would have appeared in situ. To anchor the light projection design in the materiality of the stone reliefs as much as possible, the appointee will work with IPCH scientists to locate and characterize any remaining microscopic paint residues using a combination of scientific imaging and micro-analysis techniques. They will also collaborate with colleagues at the Yale Babylonian Collection at the Yale Peabody Museum to contextualize the scientific findings with respect to similar research available in other collections and historic sources. The outcome of the project will include light projection color schema in addition to other visual and textual elements for use in gallery and digital platforms. A key aspect of the project involves working with the Peabody Museum's [EVOLUTIONS program](#) (Evoking Learning and Understanding through Investigations of the Natural Sciences, or EVO for short), which is a free youth program for New Haven and West Haven high school students.

Position and application information:

The postdoctoral associate position is a full-time, 12-month position (renewable for a 2nd year pending funding). A starting date between May 1 and June 30, 2023 is desired. Salary will be based on Yale's guidelines for postdoctoral positions, which establish a minimum of \$56,448 for 1st-year postdocs (postdocs.yale.edu/policies/compensation). Allowable relocation costs up to \$4000 will be reimbursed. For a description of benefits, including health insurance, please visit postdocs.yale.edu/applicants/yale-benefit-summary. Support for travel associated with projects is provided. This position is based primarily on Yale's West Campus on the border of West Haven and Orange CT, and requires visits to collection spaces on Central Campus in New Haven. There is a free shuttle service between Yale's campuses, and parking at West Campus is free of charge.

Application process:

- The closing date for applications is **March 24, 2023**; review will begin immediately and continue until the position is filled.
- Send an email or document describing your interest in the position, your CV, and the names of and contact information for two references to Marcie Wiggins (marcie.wiggins@yale.edu) at the Institute for the Preservation of Cultural Heritage.
- At IPCH and the Yale Peabody Museum we are working on Diversity, Equity, Accessibility, and Inclusion institutional priorities so that we can learn to better serve our communities, amplify marginalized voices and perspectives, and create a welcoming and inclusive environment for all. The ideal candidate will be ready to share their experience with and interest in contributing to this work. Please address in your cover letter how Diversity, Equity, Accessibility, and Inclusion relate to your professional experience and goals.
- We welcome and encourage applications from individuals of all backgrounds, especially those from traditionally underrepresented groups in the museum field.

Required qualifications:

- Recent completion of a graduate degree at the doctoral level in fields including archaeology/anthropology, cultural heritage science (conservation science), physical sciences (chemistry, materials science and engineering), Near Eastern or Classical studies, technical art history, or related fields.

Desired Skills & Related Activities

- Experience with imaging and instrumental analysis techniques used to identify pigments and colorants. Ability to collect and analyze data using methods including in-situ x-ray fluorescence spectroscopy and Raman spectroscopy as well as sample-based techniques (FTIR, SEM-EDS, etc.).
- Ability to engage with scholarship on the cultural history of Assyrian art (applicants do not need to be experts in Assyrian history) and current research into ancient polychromy. Connect with curators, conservators, and scientists at other institutions to learn about and incorporate their findings into this study.
- Ability to work collaboratively within a multidisciplinary and cross-institutional setting involving scientists, cultural historians, museum programming and outreach specialists, as well as a wide range of supporting departments.
- Demonstrated robust verbal and written communication skills. The selected candidate will communicate scientific findings to audiences ranging from specialists to the public. Modalities may include written analytical reports; gallery content in the form of graphic representations of polychromy and written description of analysis processes for museum audiences; in-person engagement with high-school student participants in the Yale Peabody Museum's EVO program; written and visual website and social media content.
- Organizational skills needed for project management.

About the Institute for the Preservation of Cultural Heritage

The Institute for the Preservation of Cultural Heritage (IPCH) is the collaborative and programmatic nexus of preservation and conservation expertise across Yale's libraries, museums, and special collections. Established in 2011, IPCH enacts its mission to advance the preservation and interpretation of the world's cultural heritage through collaborative research, practice, training, and outreach. Located on the Yale West

Campus, IPCH engages with scholars and students and with its world-class collections, including those of the Yale University Art Gallery, the Yale Peabody Museum of Natural History, the Yale Center for British Art, and the Yale University Library. The Technical Studies Lab at IPCH decodes art and artifacts, enabling scholars across disciplines to incisively interpret origins and histories. Fundamental to this work is understanding and managing change, especially deterioration, and its detection, monitoring, and treatment. We also develop tools and methodologies that enable new modes of studying art and artifacts. Facilities include a variety of XRF instruments, optical microscopes, FTIR microscope, Raman microscope, SEM/EDS, GC/MS, UV/visible spectroscopy, and an array of accelerated aging and mechanical testing equipment.

Yale University considers applicants for employment without regard to and does not discriminate on the basis of an individual's sex, race, color, religion, age, disability, status as a veteran, or national or ethnic origin; nor does Yale discriminate on the basis of sexual orientation or gender identity or expression.

Aniko Bezur
Wallace S. Wilson Director of Scientific Research
Institute for the Preservation of Cultural Heritage, Yale University
West Haven CT



OPEN THEME PHD FELLOWSHIP WITHIN 'PRESERVATION/CONSERVATION', THE ROYAL DANISH ACADEMY

The Royal Danish Academy is offering a PhD fellowship within the field of the preservation and/or conservation of cultural or natural heritage.

The Royal Danish Academy, Institute of Conservation, is seeking a candidate for a PhD project to study a topic within the field of the preservation and/or conservation of cultural or natural heritage. The aim is to engender new knowledge about active or preventive conservation, preservation, methodology or analyses, thereby helping to enhance our understanding of active or preventive preservation, optimization of materials, methods or processes.

In the long term, this new knowledge will be instrumental in the development of the conservation profession or solving museum-related or societal challenges. The project thus falls within the scope of the Institute of Conservation's current research focus on preservation.

We are looking for qualified proposals for a defined thesis statement, relevant research questions and the associated theoretical angles and research methods.

Ideally, the candidate will hold a master's degree in conservation or a similar relevant field of study. The PhD fellow will be employed at the Royal Academy and enrolled in the Academy's PhD School. They will be based at the Institute of Conservation at the Royal Academy.

Qualification requirements

The PhD fellowship is a three-year (full-time) programme. At the time of appointment, the applicant must hold a master's degree (120 ECTS or equivalent) in conservation or a similar relevant subject. Alternatively, the applicant must be able to document master's-level competences on the basis of long-term education (4-5 years), knowledge, qualifications and skills, including research and/or professional experience in conservation or the like.

Terms of appointment

Enrolment is for the purpose of acquiring a PhD and entails three-years' employment as a paid PhD fellow by agreement between the Danish Ministry of Taxation and the Danish Confederation of Professional Associations (Akademikerne): Protocol on PhD fellowships (Appendix 5). The salary consists of a basic salary determined by seniority and a fixed, non-pensionable supplement, and starts at 341,382 DKK annually. The legal basis for the PhD programme and the award of a PhD degree at the Royal Academy is defined principally in the Act on Higher Artistic Educational Institutions (cf. Legislative Order No. 1673 of 11 December 2013) and the Ministry of Higher Education and Science's PhD Order No. 1039 of 29 August 2013.

What the application must include

There is no application form. The application must be written in Danish, Norwegian, Swedish or English.

The application must be submitted as a single PDF file and must include:

- A motivated application – 1 x A4 page
- Project description – 5 x A4 pages. The project description must include the following:
 - - Problem statement
 - - Description of the objectives of the project and its innovation
 - - State-of-the-Art
 - - Possible research questions and hypotheses
 - - Description of relevant research methods
- In addition to the 5 x A4 pages: A timetable for the project (course participation accounts for 1/6 of the total period) and reference list
- CV and publication list (if any)
- A text example of your own written communication
- Diplomas and transcripts of passed exams

The application

Submit your application and appendices electronically via the online advertisement: <https://candidate.hr-manager.net/ApplicationInit.aspx?cid=5001&ProjectId=166462&DepartmentId=7810&MediaId=5>

The application with appendices must be submitted online by following the above link **no later than 12:00 noon (CET) on 10 May 2023**. (Please note: since the system requires two documents to be uploaded, please add an empty document in addition to the total application PDF). Any applications or application material received after the application deadline will not be taken into account in the assessment. The same applies to applications that do not meet the content requirements listed above.

Additional Information

Information about the formalities of the application process can be obtained on request from Ditte Dahl at the Academy's PhD School: ditte.dahl@kglakademi.dk

Details about the content of the position can be obtained on request from Dean of Conservation Rikke Bjarnhof: rja@kglakademi.dk

Anyone who fulfils the requirements for a Master's-level academic education is encouraged to apply for the fellowship, regardless of age, gender, religion or ethnic background.

About the Institute of Conservation

The Institute of Conservation educates conservators and carries out research that contributes to the preservation of our common cultural and natural heritage as

irreplaceable assets for humanity as a whole. On the basis of research and in discussion with the outside world, we develop our conservation programmes, making them some of the best in the world. We conduct our research in collaboration with museums and other research institutions, contributing to research-based teaching and to developing applied conservation for the academic environments.

The Institute of Conservation is located in central Copenhagen, Denmark.

On behalf of the Institute of Conservation,
Morten Ryhl-Svendsen
Associate Professor, PhD



LSCE POSITION: RESEARCHER IN ¹⁴C **GEOCHEMICAL AND** **GEOCHRONOLOGICAL**

Hello

The LSCE (Université Paris-Saclay, Gif-sur-Yvette, France) is looking for a highly motivated researcher in ¹⁴C geochronology and geochemistry. Whatever your favorite scientific topic, if ¹⁴C is your main approach, if you like writing the word "¹⁴C" in articles and projects to get funding and if you dream of chemistry, join us! This is a permanent CEA position to be filled as soon as possible.

The theoretical deadline to apply is mid-March. But if you need more time to apply, just send me an email and we'll wait for you!

More information on this link and by asking us.

Researcher in ¹⁴C geochemical and geochronological (M/F)

https://www.emploi.cea.fr/job/emploi-chercheur-en-geochimie-et-geochronologie-h-f_25304.aspx?LCID=2057

all the very best

Christine

Christine HATTÉ

email: christine.hatte@lsce.ipsl.fr

RESEARCH ASSOCIATE II/III OR **RESEARCH SPECIALIST, NATIONAL OCEAN** **SCIENCES AMS FACILITY**

The NOSAMS facility has an open position for a Research Associate or Specialist to maintain, develop, and operate two 14C AMS systems. Please see this link [<https://careers-whoicims.com/jobs/2015/research-associate/job>] for more information and to apply.

JOB SUMMARY

The National Ocean Sciences Accelerator Mass Spectrometry (NOSAMS) facility at the Woods Hole Oceanographic Institution (WHOI) is seeking a Research Associate or Research Specialist for the maintenance, development, and operation of two 14C Accelerator Mass Spectrometry (AMS) systems. The first AMS system is based upon a 500 kV Pelletron accelerator and incorporates both a conventional graphite sputter source and a unique, gas-accepting, microwave ion source. The second AMS system is a Mini Carbon Dating System (MiCaDaS) from Ionplus AG that was installed in 2022. The MiCaDaS system comes with several sample-to-gas-to ion source interfaces to allow enhanced NOSAMS capabilities and unique research directions.

The level of appointment and supervision will depend on the candidate's relevant prior experience. The candidate will work within the NOSAMS team to provide high quality 14C measurements and expertise to the ocean science community, and to enhance NOSAMS capabilities. In particular, the candidate is expected to assist in the operation and maintenance of the AMS system for sample analyses to obtain the highest quality measurements. Participation in technology development in one or more of the following topics is anticipated: accelerator physics, ion source operation, ion optics, and sample-to-source interfaces.

This is a full time exempt position and is eligible for full benefits.

ESSENTIAL FUNCTIONS

Works independently to maintain and operate an 14C AMS system.

Practices judgment and creativity in making adaptations or modifications to instrumentation and laboratory methods.

Exercises technical responsibility for organizing and interpreting required collected data. May supervise technical staff personnel within the facility.

Develops important techniques and designs that improve NOSAMS capabilities.

Writes peer-reviewed publications and presents research results at national and international scientific meetings.

EDUCATION AND EXPERIENCE

A Ph.D. is desirable. However, a Masters or B.S. degree with extensive relevant work experience is acceptable. Prior experience with operating and troubleshooting complex systems related to accelerator mass spectrometry would be valuable. Some high-level language programming (Visual Basic, SQL) and experience with CAD and equipment control software (LabVIEW) are desirable.

Ability to work with a diverse group, interact with scientific community, schedule and prioritize tasks, and independently handle a broad range of research activities is essential. Some weekend and after hours work is to be expected.

RESEARCH ASSOCIATE II/III (minimum requirements)

- Masters or B.S. degree in physics, engineering, physical sciences or a related field with several years of relevant experience
- Demonstrated technical skill, motivation, independence, and creativity necessary to complete difficult tasks

RESEARCH SPECIALIST (minimum requirements)

- Ph.D. in physics, engineering, physical sciences or a related field with several years of relevant experience

PHYSICAL REQUIREMENTS

Physical duties for this position include but are not limited to ability to lift above the shoulder, shoulder to knee, knee to floor; lifting 25-30 lbs., two to three times per hour, 1-2 times per day. Carrying 10-25 lbs., one to two times per hour, 2-3 times per day; Manual dexterity and mobility, use of hands for basic grasping and fine manipulation, and occasional reaching, bending, stooping, kneeling and crouching. Physical duties are subject to change.

SEA DUTY

n/a

**TWO FULLY FUNDED SIX-MONTH
FELLOWSHIPS FOR THE ANALYTICAL
STUDY OF PRE-MODERN PLASTERS OR
CERAMICS FROM THE EASTERN
MEDITERRANEAN, THE CYPRUS
INSTITUTE (CYI)**

The Cyprus Institute (CyI) offers two fully funded six-month fellowships for the analytical study of pre-modern plasters or ceramics from the eastern Mediterranean.

The fellowships are announced in the frame of the Horizon 2020 MSCA-ETN-ITN project “Training the next generation of archaeological scientists: Interdisciplinary studies of pre-modern Plasters and Ceramics from the eastern Mediterranean (PlaCe-ITN)”. This high-profile Innovative Training Network aims at training Early-Stage Researchers to conduct state-of-the-art, science-based research on the provenance, use, and technology of plasters and ceramics, in pre-modern societies in different regions of the eastern Mediterranean.

<https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fonlinerecruitment.exelsyslive.com%2F%3F%3D6E7274A2-8EBA-4BEA-905B-06F790EEB566%26v%3D2023%2F0153&data=05%7C01%7Caegeanet%40lists.ku.edu%7C7f882893bd8f491ce17608db254f74bd%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638144795479209201%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCi6Mn0%3D%7C3000%7C%7C&sdata=rGyO0Gi%2B1FOFboG4axCYr9Efq%2Bk0%2FtW7gzO9ysyp5JM%3D&reserved=0>

Reference number: STARC_RA_21_05(2)

Closing date: Tuesday, 18 April 2023, for recruitment from 1 September 2023, or thereafter.

These short-term Early-Stage Research fellowships are designed for Researchers that are already doctoral students at another Institution and seek to receive training and develop their analytical skills in the interdisciplinary study of archaeological plasters and ceramics at CyI.

The research to be conducted during these fellowships is expected to directly support and contribute to the main doctoral studies of the applicants, as well as having a close link to the main topic of PlaCe-ITN and the analytical and supervisory capabilities of the CyI. These fellowships will be co-supervised by the CyI and the respective PhD supervisors at the external host universities. The short fellowships will take place at the CyI labs with the potential for secondments to other laboratories of the consortium, according to the needs of the pursued doctoral research topics.

No short-term fellow will be recruited without full approval of their home institution, and preference will be given to applicants who do not have access to analytical support at their home institution.

The selected candidates will need to have already secured the plaster or ceramic materials intended for analysis by the commencement of their fellowships, together with all the necessary permits for their study and sampling by the relevant authorities. During their six-month fellowships at STARC, they will be trained through practice in one or more of the following:

- Research project design and sampling strategies
- Sample preparation for analysis (thin sections and/or polished blocks)
- Analytical techniques for the technological, compositional, microstructural characterisation of plaster or ceramic samples (hphXRF, petrography, and/or SEM)
- Data processing
- Data interpretation and integration in cultural and historical contexts.

The work conducted during each of these six-month fellowships should ideally lead to at least one publication of results in a peer-reviewed scientific journal.

According to the eligibility criteria set by the European Commission and the particular MSCA-ITN-2020 call, the recruited Early-Stage Researchers (ESRs) will have to comply with the following conditions:

- not have resided in Cyprus for more than 12 months in the 3 years immediately before the recruitment date, and not have carried out their main activity (work, studies, etc.) in Cyprus. Short stays, such as holidays, are not taken into account;
- be — at the date of recruitment — an ‘early-stage researcher’ (i.e., in the first four years of their research career and not have a doctoral degree).

Qualified applicants from all countries are welcome to submit an application, provided they meet the above-mentioned eligibility criteria.

Responsibilities

- Research project design and sampling strategies
- Sample preparation for analysis
- Technological, compositional, microstructural characterisation of plaster or ceramic samples
- Data processing
- Data interpretation and integration in cultural and historical contexts
- Presentation and dissemination of results, including the preparation of at least one open-access publication in a peer-reviewed scientific journal

Required Experience and Qualifications

- MSc/MA in Material Sciences, Archaeological Sciences, Artefact studies, Archaeology, Cultural Heritage, Geology, or related fields
- BSc/BA in Archaeology, Cultural Heritage, Archaeological Sciences, Material Sciences, Geology, or related fields
- Enrolled in a PhD programme and be - at the date of recruitment - an 'early-stage researcher' as defined by MSCA rules (i.e., in the first four years of their research career and not have a doctoral degree).

- Excellent communication and interpersonal skills.

Application

For full consideration, interested applicants should process their application at The Cyprus Institute Exelsys Platform

(<https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fonlinerecruitment.exelsyslive.com%2F%3F%3D6E7274A2-8EBA-4BEA-905B-06F790EEB566%26v%3D2023%2F0153&data=05%7C01%7Caegeanet%40lists.ku.edu%7C7f882893bd8f491ce17608db254f74bd%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638144795479209201%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6I6k1haWwiLCJXVCi6Mn0%3D%7C3000%7C%7C%7C&sdata=rGyO0Gi%2B1FOFboG4axCYr9Ef%2Bk0%2FtW7gzO9ysyp5JM%3D&reserved=0>) based on the instructions given. Applicants should submit a curriculum vitae including a letter of interest and the contact details of two referees, with one of them being their primary PhD supervisor. All documentation should be in English and in PDF Format.

For further information about the MSCA-ITN PlaCe and the ESR positions, please visit the project's website at <https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fplace-itn.cyi.ac.cy%2F&data=05%7C01%7Caegeanet%40lists.ku.edu%7C7f882893bd8f491ce17608db254f74bd%7C3c176536afe643f5b96636feabbe3c1a%7C0%7C0%7C638144795479209201%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6I6k1haWwiLCJXVCi6Mn0%3D%7C3000%7C%7C%7C&sdata=CtUccMQkBaO9fPM6AsEGV%2B11RpcUF99pvstGHmxzork%3D&reserved=0>. Please note that applications which do not follow the announcement's guidelines will not be considered.

Recruitment will continue until the positions are filled.

Closing date: Tuesday, 18 April 2023, for recruitment from 1 September 2023, or thereafter.

Contact email address: place-ITN@cyi.ac.cy

Reference number: STARC_RA_21_05(2)

Dr Maria Dikomitou Eliadou

Associate Research Scientist
H2020 MSCA-ITN PlaCe Project Manager, GA no. 956410

STARC, The Cyprus Institute
m.dikomitou@cyi.ac.cy

[cid:367B7589-414B-439B-ADAE-8C5FBDE46DFF]

JOB VACANCY, SINGAPORE] SENIOR CONSERVATION SCIENTIST, HERITAGE CONSERVATION CENTRE (HCC)

The Heritage Conservation Centre (HCC) is an institution of the National Heritage Board (NHB). It is a purpose-built facility for the storage and conservation of the National Collection comprising artworks and artefacts. Its mission is to care for, manage and facilitate access to the National Collection.

Senior Conservation Scientist

Working in close collaboration with the Chief Conservator/ Deputy Director of Conservation Services Department and reporting to the Head of Conservation Science/ Senior Assistant Director, you will work in the Conservation Science Lab. You will be responsible for developing conservation science research and programmes in support of HCC's new research strategies addressing the sustainable use and care of the growing National Collection in Singapore.

You will join a larger team of 35 over conservators that includes conservators of paintings, objects, paper, textiles, and a conservation scientist. You will be expected to possess research/ analysis experience applicable to a wide range of historical and contemporary heritage and conservation materials both organic and inorganic alongside their respective ageing behaviours; to be a strong team-player enjoying working in a collaborative manner and show initiative and resourcefulness in handling difficult and unusual analytical problems. Research areas include technical analysis of artefacts and their treatment methods, the understanding of their aging behaviour and how to reduce the rate of associated material deterioration. It encompasses selecting most appropriate, preferably non-destructive, and portable techniques of analysis and exploring most relevant methods to process, enhance, interpret, and share data obtained.

Working in close collaboration with the other members of the Conservation Science lab, the key job responsibilities are described as follows:

Responsibilities:

- Devise and implement research projects that permit creating sustainable and pragmatic storage, preservation and conservation solutions factoring in the regional context and collection needs while working collegially with conservators and appropriate external stakeholders. This includes designing, contributing, and coordinating technical studies of the National Collection, conservation materials or techniques, while working with HCC and/ or NHB staff members (including curators, collection managers and facility managers), academic and other museum scientists. It also encompasses disseminating the results obtained and associated knowledge by participating in the writing of papers for publication in art historical, conservation, or scientific journals or in the oral presentation during relevant conferences.

- Conduct analyses for the study of the National Collections and its care to support the needs of the various conservation sections alongside the HCC's cross-department working groups focusing on preventive conservation and material testing. Techniques include but are not limited to 2D and 3D technical imaging.
- Develop and/ or optimise analytical capability to study physical and chemical properties including ageing behaviour of materials pertaining to the National Collections and its care. Techniques include but are not limited to acoustic emission testing, spectroscopy (FTIR, Raman), mechanical testing (universal testing machines, tensile strength meter), thermal and mass analysis (TGA/ DSC), surface and appearance measurements.
- Initiate and/ or contribute to fundraising effort to support research projects of various sizes, involving collaboration with diverse external and/ or internal stakeholders at local, regional, and international levels.
- Instruct and supervise fellows, interns, and students in understanding and performing materials analysis and/ or research projects on the collection.
- Design and deliver basic scientific training or research guidance for conservators and at times for other museum professionals interested in the applications of conservation science.
- Effectively communicate the work of conservation science to both professional colleagues and non-technical audiences through tours, lectures, web content, and video.
- Staying abreast of developments in the application of scientific techniques to the analysis of historical and contemporary heritage and conservation materials through journal research and attendance at conferences and seminars.

Requirements:

- Ph.D. or Masters in Conservation Science, Chemistry or other physical science. Applicants who may not have the required qualifications but have relevant work experience will be considered.
- Preferably minimum of 10 years of experience in a museum conservation science laboratory, or equivalent combination of professional experience and formal training. Experience should include designing, developing, contributing and/ or managing research projects of different sizes and complexity levels, including project fundraising, budget administration and team leadership. Candidate with lesser experience may be considered for the position of Conservation Scientist.
- Be a curious, innovative, enthusiastic, problem-solving, and open-minded individual enjoying working on complex issues in collaboration with a team of specialists with diverse perspectives. Commitment to developing sustainable approach to work and solution would be highly valued.
- Experience with relevant protocols for characterising and monitoring physical and chemical properties of materials and their ageing behaviour.
- Working knowledge in instrumentation and adequate development for non-destructive analyses. Familiarity with instrumentation in conservation science such as, but not limited to various type of microscopy, technical imaging, SEM-EDS, FTIR, Raman, Py-GC/MS, LC/MS, XRF, XRD, etc.
- Ability to analyse data, prepare technical reports and communicate results to stakeholders and to collaborate effectively with conservators, curators, collections managers, museum educators, academic scientists, and scientists from other

museums to interpret results obtained and disseminate the work to non-technical audiences.

- Cross-cultural knowledge and appreciation of art and art history is appreciated. Broad knowledge in artists' materials and techniques is expected, and knowledge in materials used in Southeast Asia and Asia would be a plus.
- A record of peer-reviewed research and publications is required.
- Strong oral, written and interpersonal communication skills in English is required.

Work Location:

The Senior Conservation Scientist shall mostly be based at HCC, 32 Jurong Port Road, Singapore 619104.

Salary Range: est \$7800 (Singapore Dollar) with attractive Relocation and Benefits Package

To apply, please submit to the link below.

[Find A Job | Careers@Gov \(hrp.gov.sg\)](https://careers.gov.sg)

All interested applicants should follow the instructions at the Careers@Gov website to submit their application.

Deadline for submission is 24 April 2023.

Please direct any questions to:

Lee Swee Mun
Senior Assistant Director - Conservation Services
Heritage Conservation Centre
Singapore
lee_swee_mun@nhb.gov.sg

Lee Swee Mun
Senior Assistant Director - Conservation Services
Heritage Conservation Centre
Singapore
lee_swee_mun@nhb.gov.sg



UCL INSTITUTE OF ARCHAEOLOGY **HERITAGE AND MUSEUMS OPPORTUNITY** **SCHOLARSHIP**

The Institute is funding a scholarship for a candidate from Black British, British Pakistani or British Bangladeshi backgrounds.

This forms part of a positive action initiative to open opportunities to groups that UCL equalities data shows are historically and currently under-represented in the Heritage IoA student body as well as within the heritage sector.

The scholarship applies to candidates accepted onto one of the following courses: UCL Institute of Archaeology's [MA in Museum Studies](#), [MA in Public Archaeology](#), [MA in Principles of Conservation](#) or [MA in Cultural Heritage Studies](#). The scholarship covers course fees only for a UK domiciled student from one of the following minority groups:

- Black British African, Black British Caribbean, Black British other or Mixed Black British
- British Pakistani
- British Bangladeshi

A separate [application form](#) should be submitted to [Lisa Daniel](#) by **1 May 2023**.

Selection will be made by a panel of UCL course tutors, as well as representatives from the heritage sector who will make a decision based on the combined strength of the candidate's academic qualifications and their personal statement regarding their commitment to the heritage sector.

Any queries please email [Lisa Daniel](#), Graduate Admissions Administrator.

Please visit the site: https://www.ucl.ac.uk/archaeology/study/graduate-taught/applying/heritage-and-museums-opportunity-scholarship?fbclid=IwAR3r3JNP6J_UWMvitKqaZNjLdiY8b2WxCXHnk7anos6GeaFEw8b7dq5DkQ

RESEARCH ASSOCIATE FOR THE PROJECT **“EXC 2176 UNDERSTANDING WRITTEN** **ARTEFACTS” § 28 SUBSECTION 3 HMBHG**

Institution: Cluster of Excellence „Understanding Written Artefacts“ (manuscript research)

Salary level: EGR. 13 TV-L

Start date: as soon as possible, fixed until 31.05.2026 (This is a fixed-term contract in accordance with Section 2 of the academic fixed-term labor contract act [Wissenschaftszeitvertragsgesetz, WissZeitVG]).

Application deadline: 26.04.2023

Scope of workpart-time

Weekly hours 75 % of standard work hours per week

The Cluster of Excellence “Understanding Written Artefacts” is looking to recruit doctoral research associates to pursue their dissertation project.

The Cluster offers the exciting opportunity to contribute to research on written artefacts in an international team of researchers from across forty disciplines in the humanities, the natural sciences and computer science. Within this highly inspiring and collaborative environment, you will pursue your own dissertation project as well as contribute to the Cluster’s research programme as a whole through your active engagement in its internal and wider research activities. The position includes the enrollment in the Cluster's graduate school and participation in research colloquia, lecture series and workshops.

The Cluster features a range of facilities and supportive measures from which its researchers can benefit (see <https://www.csmc.uni-hamburg.de/written-artefacts.html> or further information).

Responsibilities

The core responsibility of the research associate is to pursue their dissertation project that fits the overall comparative research profile of the Cluster of Excellence “Understanding Written Artefacts”, and to contribute to the collaborative research activities of the Cluster. Research associates may also pursue further academic qualifications.

Requirements

A university degree in a relevant field.

Candidates should have a strong interest in cooperating beyond disciplinary boundaries, especially across the humanities, natural science and computer sciences.

Fluent in English, written and spoken.

We welcome applications for projects with a clear focus on the study of written artefacts, particularly on one of the following topics:

handwritten artefacts in the digital age written artefacts such as pottery, textiles, metal, bones written artefacts and provenance studies

Candidates must apply with a project proposal (in English) of max. 5 pages (plus bibliography), including a brief summary, literature review, a detailed project description and a 3-year schedule. The proposed project must fit the overall research profile of the Cluster of Excellence “Understanding Written Artefacts” and candidates are encouraged to identify a Research Field in which they situate their project. For further information, see <https://www.csmc.uni-hamburg.de/written-artefacts.html>.

A preferred supervisor from the Cluster should be named in the applicant’s cover letter. PhD students with ongoing projects are also eligible to apply and supervisors external to Universität Hamburg can be members of the supervisory committee. The first supervisor has to be from the Cluster.

As a University of Excellence, Universität Hamburg is one of the strongest research universities in Germany. As a flagship university in the greater Hamburg region, it nurtures innovative, cooperative contacts to partners within and outside academia. It also provides and promotes sustainable education, knowledge, and knowledge exchange locally, nationally, and internationally.

Severely disabled and disabled applicants with the same status will receive preference over equally qualified non-disabled applicants.

Instructions for applying

Contact Dr. Eva Jungbluth <eva.jungbluth@uni-hamburg.de>

Reference number: 106

Location:

Warburgstraße 26-28

20354 Hamburg

Zu Google Maps

Application deadline

26.04.2023

Send us your complete application documents (cover letter, curriculum vitae, copies of degree certificate[s] further documents stipulated to the job advertisement and if necessary ID attesting to your disability or proof of equivalent status) via the online application form only.

If you experience technical problems, send an email to bewerbungen@uni-hamburg.de.

More information on data protection in selection procedures.

From <https://www.uni-hamburg.de/stellenangebote/ausschreibung.html?jobID=2c372021cdb6ff2c64a56b1d8102ec996320586>

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

RAA2023–RAMAN SPECTROSCOPY TRAINING SCHOOL

Dear Raman Enthusiasts!

We proudly announce the scientists involved in the Raman Spectroscopy Training School (4-5 September 2023), hosted by the National Gallery-Alexandros Soutzos Museum, Athens, Greece, in collaboration with Ghent University, Belgium.

The Raman spectroscopy training school is focused on the application of Raman spectroscopy technique(s) on art and archaeology. The training school will be focused on the basic Raman theory, applications and instrumental advances and will also include training on mobile Raman spectroscopy. Moreover, a certificate of attendance will be issued. Please, note that the training school will have a limited capacity.

Find below a provisional programme related to the Raman Spectroscopy Training School:

Monday 04/09/2023

Morning Sessions:

Peter Vandenabeele-Raman Spectroscopy: Basic Theory-Data Processing and Interpretation

Anastasia Rousaki-Mobile Raman Spectroscopy: Direct and on field analysis of artworks

Afternoon Session:

Danilo Bersani-Raman Spectroscopy: Application on Gemstones and Data Processing

Tuesday 05/09/2023

Morning Sessions:

Juan Manuel Madariaga-Raman Spectroscopy: Murals and Degradation

Federica Pozzi-Surface-enhanced Raman spectroscopy (SERS): Theory and Applications

Afternoon Session:

Training on mobile Raman spectroscopy

Further information, will be regularly updated on the conference website under the dedicated tab ([Training School | RAA 2023 \(ugent.be\)](#)).

Don't forget that the abstract(s) submission deadline for the RAA2023 conference is approaching! Submit your abstract(s) via the conference web page ([| RAA 2023 \(ugent.be\)](#))!

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

GEOCHRONOLOGY SUMMER SCHOOL IN MORTERATSCH, SWITZERLAND 2023

Dear colleagues,

it is our pleasure to announce the

14th International Geochronology Summer School:

Dating techniques in environmental research

Date: **27-31 August 2023**

Location: **Morteratsch (Switzerland)**

Webinfo: <http://www.geo.uzh.ch/en/units/gch/geochronologysummerschool.html>

Topics to be covered in lectures, excursions and workshops include dating techniques such as numerical methods

(radiocarbon, exposure dating with cosmogenic nuclides, OSL, ¹³⁷Cs, ²¹⁰Pb, etc.), dendrochronology, anthracology, archaeomagnetic dating, palaeolimnology, as well as relative methods like soil weathering and Schmidt-hammer technique.

List of Lecturers:

Holger Gärtner (WSL), Paolo Cherubini (WSL), Markus Egli (University of Zurich), Dmitry Tikhomirov (University of Zurich), Dennis Dahms (University of Northern Iowa), Irka Hajdas (ETH Zurich), Evdokia Tema (University of Torino), Elena Serra (University of Bern), Nathalie Dubois (EAWAG) and others.

The Summer School is open to young researchers (PhD students and Post-Docs) worldwide.

Participation is competitive and will be limited to a maximum of 20.

The registration fee (800 CHF) includes accommodation (room sharing required), half board and lunch, field trips and teaching material.

DEADLINE FOR APPLICATIONS: 30 April 2023

Registration:

<http://www.geo.uzh.ch/en/units/gch/geochronologysummerschool/registration.html>

INTERNET SITES

THE ARCHAEOMETALLURGY OF IRON: AN INTRODUCTION FOR STUDENTS OF ARCHAEOLOGY

Colleagues, friends, family

I am pleased to announce this new Web publication:

The archaeometallurgy of iron: An introduction for students of archaeology
<http://donwagner.dk/arch-iron>

This is from the introduction:

This multimedia textbook was originally intended for Chinese students of archaeology, but I hope it will also prove useful for Western students, especially those who wish to know more about the Chinese scene. It introduces the necessary background for reading and understanding archaeometallurgical publications, and provides a broad foundation for students who wish to go further in archaeometallurgy. Readers will profit from some knowledge of chemistry and physics, but I have in general tried to avoid too much technical detail. Students preparing for original research in archaeometallurgy will need more advanced training, especially in chemistry and the science of metallurgy.

I have written this textbook in collaboration with the Department of Archaeology of Sichuan University, where it is being translated into Chinese.

同事、朋友、家人

我很高兴地宣布这个新的网络出版物：

铁的考古冶金学：考古学学生入门

<http://donwagner.dk/arch-iron>

这是来自简介：

这本多媒体教材原本是为中国考古专业的学生准备的，但我希望它也能对西方学生有所帮助，尤其是那些希望更多地了解中国考古的学生。

它介绍了阅读和理解考古冶金出版物的必要背景，为希望在考古冶金学上更进一步的学生提供了广阔的基础。

读者会从一些化学和物理知识中获益，但我通常会尽量避免过多的技术细节。

为考古冶金学的原创性研究做准备的学生需要更高级的训练，尤其是在化学和冶金科学方面。

我与四川大学历史文化学院考古系合作编写了这本教科书，目前正在翻译成中文。

dr.phil. Donald B. Wagner
Jernbanegade 9B
DK-3600 Frederikssund
Denmark
Tel. +45-3331 2581
<http://donwagner.dk>

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

ANCIENT EGYPT, NEW TECHNOLOGY

The Present and Future of Computer Visualization, Virtual Reality and Other Digital Humanities in Egyptology Harvard Egyptological Studies, 17 Rita Lucarelli, Joshua A. Roberson, and Steve Vinson Hardback
ISBN: 978-90-04-50128-7
\$174.00

This volume of collected studies takes stock of most recent developments in Egyptology and the Digital Humanities, considering future directions for the application of new technologies in Egyptology. The book presents the results of an international conference held in 2019 at Indiana University – Bloomington, in which Egyptologists and digital humanists with interest in Egyptology gathered in 2019 to present current projects in 3D modeling, virtual and augmented reality, game technology, digital pedagogy, database projects, computational and corpus linguistics and E-publications. Those projects, along with a selection of others that were not presented in Bloomington, are now described and discussed in this volume.

Please visit the site: <https://brill.com/edcollbook-oa/title/55882> [Go there for download]

FEBRUARY 2023 VOL. 46 ISSUE 1 OF **THE JOURNAL OF THE INSTITUTE OF** **CONSERVATION**

The February 2023 Vol. 46 Issue 1 of the *Journal of the Institute of Conservation* is now online with the print issue out soon

www.icon.org.uk/resources/...

www.tandfonline.com/toc/rcon20/current

Volume 46 • Number 1 • 2023 • ISSN 1945-5224

Editorial

Dr Jonathan Kemp Editor

Pages: 1-2 | DOI: 10.1080/19455224.2023.2174292

Three works on paper by Vincent Van Gogh: technical study, display considerations and a conjectural colour reconstruction

Joyce H. Townsend & Rosie Freemantle

Pages: 3-22 | DOI: 10.1080/19455224.2022.2161097 (free-to-view)

Towards a methodological approach to identify the main components used in historic photographs

Alejandra Nieto Villena, José Refugio Martínez, Azdrubal Lobo Guerrero, José Luis Arauz Lara, José Manuel Flores-Camacho, Alfonso Lastras-Martínez, José Ángel de la Cruz Mendoza, Gerardo Ortega Zarzosa & Álvaro Solbes García

Pages: 23-36 | DOI: 10.1080/19455224.2022.2157459 (free-to-view)

The Iranian approach to architectural restoration: a style derived from nationalism

Mehdi Hooshyari

Pages: 37-49 | DOI: 10.1080/19455224.2022.2157852

An investigation into pest management and control in selected university libraries in Nigeria

Oluwole Ejiwoye Rasaki, Olugbenga Wale Adewuyi & Omawumi O. Makinde

Pages: 50-63 | DOI: 10.1080/19455224.2022.2157458

A literature review of palm leaf manuscript conservation-Part 2: historic and current conservation treatments, boxing and storage, religious and ethical issues, recommendations for best practice

Julia Wiland, Rick Brown, Lizzie Fuller, Lea Havelock, Jackie Johnson, Dorothy Kenn, Paulina Kralka, Marya Muzart, Jessica Pollard & Jenny Snowdon

Pages: 64-91 | DOI: 10.1080/19455224.2023.2167095

Book Review

[Properties of Plastics: A Guide for Conservators](#)

Thea B. van Oosten, Los Angeles, Getty Publications, 2022, 320 pp., (paperback). ISBN 978-1-60606-693-5.

Brenda Keneghan

Pages: 92-93 | DOI: 10.1080/19455224.2023.2174283

Dr Jonathan Kemp

Editor, Journal of the Institute of Conservation

www.tandfonline.com/toc/rcon20/current

REMARKS AND CAUTION ON FINDS OF KASTROULI MYCENAEAN SETTLEMENT (LOOFAH, CHARCOAL, BONE, WALL BURNT CLAY COATING, CERAMIC)

Liritzis, I., Boyatzis, S., Polymeris, G.S., Panagopoulou, A., Sideris, A., Rapti, S., Levy, T.

SCIENTIFIC CULTURE, Vol. 9, No. 2, (2023), pp. 1-28

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ABSTRACT

The excavated materials of the Late Helladic III settlement Kastrouli in Phokis, Greece has produced significant diverse information regarding chronology, human mobility, diet, characterization and provenance. The comingled burial of Tomb A and the finds from at least two buildings also contained some strange materials which properly analyzed offer a plea for caution. Moreover, they offer an opportunity to examine technological aspects, identification of species, dating and firing conditions.

The few materials investigated here by Optical microscopy (OM), SEM-EDS, FTIR and ¹⁴C include some spongy-like fibers, an incised ceramic sherd, a burnt bone, burnt clay and four radiocarbon dates of charcoal and bone. It was found that the spongy material was ¹⁴C dated to a modern loofah intruded in the tomb A; and the “decoration” in the grooves in the incised ceramic was remnants of the soil in which it was buried and not any possible incrustation or filling with unfired clay. The burnt animal bone analysis by FTIR provided a possible firing at ca 400-550 °C. The OM of the burnt clay has not produced any possible print textile. The radiocarbon dating of charcoal and one bone produced dates ca.13th c BCE, and the spans from 14thc BCE to late 12th C BCE is discussed in the light of wiggles during this period in the calibration curve.

KEYWORDS: Radiocarbon dating, Spectroscopy, Microscopy, excavation, Late Helladic, pottery, tomb, calibration, luminescence.

ANCIENT DNA FROM MESOPOTAMIA SUGGESTS DISTINCT PRE-POTTERY AND POTTERY NEOLITHIC MIGRATIONS INTO ANATOLIA

Iosif Lazaridis, Songül Alpaslan-Roodenberg et al.

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Abstract

By sequencing 727 ancient individuals from the Southern Arc (Anatolia and its neighbors in Southeastern Europe and West Asia) over 10,000 years, we contextualize its Chalcolithic period and Bronze Age (about 5000 to 1000 BCE), when extensive gene flow entangled it with the Eurasian steppe. Two streams of migration transmitted Caucasus and Anatolian/Levantine ancestry northward, and the Yamnaya pastoralists, formed on the steppe, then spread southward into the Balkans and across the Caucasus into Armenia, where they left numerous patrilineal descendants. Anatolia was transformed by intra–West Asian gene flow, with negligible impact of the later Yamnaya migrations. This contrasts with all other regions where Indo-European languages were spoken, suggesting that the homeland of the Indo-Anatolian language family was in West Asia, with only secondary dispersals of non-Anatolian Indo-Europeans from the steppe.

Please visit the site: <https://www.science.org/doi/10.1126/science.abm4247>

PROJECTILE POINTS, HUNTING AND IDENTITY AT NEOLITHIC ÇATALHÖYÜK, TURKEY, BY LILIAN DOGIAMA

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In this book Dr Lilian Dogiama considers the role of hunting at the Neolithic community of Çatalhöyük and its significance in shaping personal and communal identities by focusing on its stone projectile points. Wild faunal remains indicate that hunting remained in practice, even though domesticated animals and plants comprised the staple diet of the people of Çatalhöyük. Hunting and the ‘wild’ are venerated in the site's iconography, while obsidian projectile points -as the only surviving parts of hunting weapons- were ubiquitous in the site.

The author uses a plethora of attributes that include depositional context, use wear, impact damage, fragmentation, raw material and various techno-morphological characteristics to analyse the projectile points from the site. Her findings indicate that the Çatalhöyük projectile point assemblage consisted of two groups that were used and treated in very distinct ways. The first group comprised projectile weapons that were used in hunting and exhibit clear signs of actual use, whereas the second group consisted of bifaces that were likely reserved for ceremonial purposes given their pristine condition and special mode of deposition. Drawing from her analysis and ethnographic examples Dogiama argues that hunting was not merely an alternate subsistence strategy but an arena where symbolic expression and social identities could be performed and negotiated.

Dr Lilian Dogiama received her PhD in Anthropology from McMaster University. She has an MA in Prehistoric Archaeology from the Aristotle University of Thessaloniki and a BA in Archaeology and History of Art from the National and Kapodistrian University of Athens. [...]

CYPRUS'S COPPER DEPOSITS CREATED ONE OF THE MOST IMPORTANT TRADE HUBS IN THE BRONZE AGE

Summary: The coveted metal copper and a sheltered location turned the Cypriot village of Hala Sultan Tekke into one of the most important trade hubs of the Late Bronze Age. Recent excavations confirm the importance of the Bronze Age city in the first period of international trade in the Mediterranean. Share:

FULL STORY

The coveted metal copper and a sheltered location turned the Cypriot village of Hala Sultan Tekke into one of the most important trade hubs of the Late Bronze Age. This has been shown by excavations led by researchers from the University of Gothenburg. Their study published in the Journal of Archaeological Science confirms the importance of the Bronze Age city in the first period of international trade in the Mediterranean.

"We have found huge quantities of imported pottery in Hala Sultan Tekke, but also luxury goods made of gold, silver, ivory and semi-precious gemstones which show that the city's production of copper was a trading commodity in high demand," says Peter Fischer, emeritus professor at the Department of Historical Studies at the University of Gothenburg and the leader of the excavations.

The Swedish Cyprus Expedition is a research project that began in 1927 to map the island's archaeological history. The most recent expedition led by Peter Fischer at Hala Sultan Tekke, near the modern-day city of Larnaca on the south coast of Cyprus, started in 2010 and has continued for 13 seasons. The excavations have shown that the city covered at least 25 hectares, 14 of which comprised its centre, surrounded by a city wall. The Expedition has also found objects from this period scattered over an even larger area.

"Our investigations and excavations show that Hala Sultan Tekke was larger than was previously thought, covering an area of some 25 to 50 hectares, which is a big city by that period's standards. Usually, settlements at this time and in this area covered only a few hectares," says Peter Fischer.

During the Bronze Age, Cyprus was the largest copper producer around the Mediterranean. This metal alloyed with tin formed the basis for making bronze which was then used for casting tools, weapons and jewellery before iron started being used.

"Remains in the city show extensive copper production in the form of smelting furnaces, cast moulds and slag. The ore from which the copper was extracted was brought into the city from mines in the nearby Troodos Mountains. The workshops produced a lot of soot and were placed in the north of the city so that the winds mainly from the south would blow the soot and the stench away from the city. Today, this type of production would be impossible, since the production process generates waste products such as arsenic, lead and cadmium, but at that time people did not know how dangerous the process was," says Peter Fischer.

Large quantities of imported goods

The central location of Cyprus in the eastern Mediterranean and a well-protected harbour created very favourable conditions for lively trade in Hala Sultan Tekke. Large quantities of imported goods in the form of pottery, jewellery and other luxury goods from neighbouring regions such as modern-day Greece, Türkiye, the Middle East and Egypt, as well as longer-distance imports from Sardinia, the Baltic Sea region, Afghanistan and India have been found. These finds show that the city was one of the largest trade hubs in the period 1500-1150 BC and was of great importance during the initial period of international trade in the area.

In addition to copper, highly sought-after purple-dyed textiles were also produced. The dye came from purple dye murex species from which the mucus that produced the purple dye was extracted. The city also produced and exported pottery with characteristic painted motifs of humans, animals and plants. The researchers refer to the artist behind these painted motifs as the 'Hala Sultan Tekke painter'.

"The great thing about the many pottery finds is that we can assist our colleagues around the Mediterranean and beyond. No pottery has the same spread as the coveted Cypriot pottery during this period. By finding locally made pottery that we can date in the same layer as other imported pottery that was previously difficult to date, we can synchronise these and help colleagues date their finds," says Peter Fischer.

The name of the Bronze Age city comes from the expedition having initially named the site after the mosque, Hala Sultan Tekke, which now stands close to the excavation site. Trade flourished in the city for almost 500 years, but like several other sophisticated Bronze Age civilisations around the Mediterranean, Hala Sultan Tekke collapsed just after 1200 BC. The prevailing hypothesis was that the 'Sea Peoples' invaded the eastern Mediterranean around this time, destroying its cities and bringing the Bronze Age civilisations to an end.

"In the past, it was thought that the 'Sea Peoples' were the sole explanation. Our research in recent years has given more nuance to this explanation. For example, there are now new interpretations of written sources from this period in Anatolia (modern-day Türkiye), Syria and Egypt, which tell of epidemics, famine, revolutions and acts of war by invading peoples. In addition, our investigations indicate that a deterioration in the climate was a contributing factor. All of this may have had a domino effect, that people in search of better living conditions moved from the central Mediterranean towards the south-east, thus coming into conflict with the cultures in modern-day Greece, on Cyprus and in Egypt," concludes Peter Fischer.

Story Source:

Materials provided by University of Gothenburg. Original written by Jessica Oscarsson. Note: Content may be edited for style and length.

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Please visit the site:

<https://www.sciencedaily.com/releases/2023/03/230316114041.htm>

EΙΔΗΣΕΙΣ - NEWS RELEASE

A SCAN DISCOVERS A 30-FOOT-LONG HALLWAY INSIDE THE GREAT PYRAMID

Egypt unveiled the discovery of long corridor inside the Great Pyramid of Giza on Thursday, the first to be found on the structure's north side.

The corridor, which measures nearly 30 feet by more than 6 feet, is perched above the famous structure's main entrance and was detected using a scan, authorities said. The function of the chamber is currently unknown, although such corridors often lead to further archaeological discoveries.

Egyptian archaeologist Zahi Hawass and the country's Minister for Tourism Ahmed Eissa announced the discovery at the pyramid's base.

The chamber was discovered by the Scan Pyramids project, an international program that uses scans to look at unexplored sections of the ancient structure.

The pyramid about 11 miles from Cairo's center is also known as Khufu's Pyramid for its builder, a 4th Dynasty pharaoh who reigned from 2509 to 2483 B.C.

The ancient structure is the last surviving wonder of the ancient world. It has captivated visitors since it was built as a royal burial chamber some 4,500 years ago. Experts are divided over how it and other pyramids were constructed, so even relatively minor discoveries generate great interest.

Egypt often publicly touts ancient discoveries to attract more tourists, a major source of foreign currency for the cash-strapped North African country. The sector suffered a long downturn after the political turmoil and violence that followed a 2011 uprising.

Please visit the site: <https://www.npr.org/2023/03/02/1160589911/great-pyramid-giza-scan-discovery-egypt> [See also <https://www.jpost.com/middle-east/article-733185>

SCIENTISTS FIND SIGNS OF HORSE RIDING IN ANCIENT HUMAN REMAINS, BY NELL GREENFIELD BOYCE

Horseback riding was likely a common activity as early as 4,500 to 5,000 years ago, according to a provocative new study that looked at human skeletal remains for small signs of the physical stress associated with riding horses.

People first started keeping horses about 5,500 years ago, initially for their meat and milk, researchers believe. But how and when horses became a transformative mode of transportation isn't so clear.

"Cattle and sheep and goats were domesticated thousands of years before horses were. And horses are different from cattle and sheep and goats, in that they are essentially a transportation technology," says David Anthony, an emeritus professor of anthropology with Hartwick College.

Horses began living with humans before the invention of the wheel, and horse-drawn chariots first appeared around 4,000 years ago. About a thousand years later, there's an explosion of horses and horse-related themes depicted in artwork. And scientists have tried to collect other forms of evidence to home in on when horse riding may have first emerged.

Some researchers, like Anthony and his partner, archaeologist Dorcas Brown, have examined the teeth of ancient horses, to check for wear patterns caused by bits. The trouble is, there's not that much material out there to study, says Anthony.

"My wife and I have looked at museum collections for horse remains and been very disappointed on Kazakhstan, Russia, Ukraine, Hungary," he says, noting that the Eurasian steppe was where wild horses lived and were available to be domesticated.

The other limitation with finding horse teeth with bit wear, says Alan Outram with the University of Exeter, is that "what you've demonstrated is harnessing. You haven't specifically demonstrated riding."

So now a team led by researchers at the University of Helsinki has taken a different approach and turned to the human side of the horseback riding relationship.

Specifically, they went searching for human skeletal remains with features that could come from the kinds of physical stress associated with horseback riding, especially bareback riding that requires the legs to keep a firm grip.

The scientists examined the skeletal remains of 24 individuals from archaeological sites in southeastern Europe, checking them for six different kinds of damage that horseback riding could potentially cause in the backbone, pelvis, and leg bones.

In the journal Science Advances, they report that nine of the individuals had at least four of these tell-tale physical signs, suggesting that they likely rode horses.

"It's really important to get this evidence from the human side, which has not really been systematically analyzed before," says Anthony, one of the authors of this study. "It just shows that riding could emerge at a very early stage in the domestication process."

Everything this research team did looks valid and it makes sense theoretically, agrees Outram, who was not part of this research group. He does caution that it's possible some other kind of unknown physical activity might exist that could have created these features.

"It's not an absolute 100% proof, but the quality of the paper is very good," says Outram, who notes that it is the nature of archaeological evidence to have some ambiguity.

"What's fair to say is that it is, at the moment, the earliest evidence that could indicate horse riding," says Outram.

He notes that until the development of the steam train, horses provided the fastest means of land transportation, dramatically changing people's conception of distance and their ability to travel.

Pre-modern horses, however, were likely nervous and easily spooked, so their initial uses might have been modest.

"They probably were not suitable to be ridden into anything like a violent confrontation," says Anthony, suggesting that people on horses could have just herded larger groups of sheep or goats, and that it wasn't until much later that horses became a powerful weapon in warfare and conquests.

But who first had the bright idea of trying to ride a large, potentially dangerous animal like a horse? Anthony thinks it's something that would only occur to someone looking for a thrill, someone who wouldn't mind repeatedly getting thrown off.

"If you were, say, 12 years old, you know, and your sense of fear was not as highly developed," says Anthony, adding that he thinks the first people to ride horses "were probably adolescents who were challenging each other to try again."

Please visit the site: <https://www.npr.org/2023/03/03/1160961227/scientists-find-signs-of-horse-riding-in-ancient-human-remains> [See also <https://www.scientificamerican.com/article/humans-started-riding-horses-5-000-years-ago-new-evidence-suggests/>]

ANCIENT DNA REVEALS HISTORY OF HUNTER-GATHERERS IN EUROPE, BY CARL ZIMMER

Looking at DNA gleaned from ancient remains, researchers identified at least eight previously unknown populations of early Europeans.

In the 1800s, archaeologists began reconstructing the deep history of Europe from the bones of ancient hunter-gatherers and the iconic art they left behind, like cave paintings, fertility figurines and “lion-man” statues.

Over the past decade, geneticists have added a new dimension to that history by extracting DNA from teeth and bones.

And now, in a pair of studies published on Wednesday, researchers have produced the most robust analysis yet of the genetic record of prehistoric Europe.

Looking at DNA gleaned from the remains of 357 ancient Europeans, researchers discovered that several waves of hunter-gatherers migrated into Europe. The studies identified at least eight populations, some more genetically distinct from each other than modern-day Europeans and Asians. They coexisted in Europe for thousands of years, apparently trading tools and sharing cultures. Some groups survived the Ice Age, while others vanished, perhaps wiped out by other groups.

“We are finally understanding the dynamics of European hunter-gatherers,” said Vanessa Villalba-Mouco, a paleogeneticist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and an author of both studies.

The new genetic analysis suggests that when farmers arrived in Europe about 8,000 years ago, they encountered the descendants of this long history, with light-skinned, dark-eyed people to the east, and possibly dark-skinned and blue-eyed people to the west.

Dr. Villalba-Mouco and her colleagues have given these peoples a list of new names that can be as hard to memorize as the kingdoms of Westeros: the Fournol, the Vestonice, the GoyetQ2, the Villabruna, the Oberkassel and the Sidelkino, among others.

But the scientists are only just beginning to understand how so many different groups emerged 45,000 to 5,000 years ago.

“I didn’t expect these amounts of replacements and changes in ancestry,” said Carles Lalueza-Fox, the director of the Natural Sciences Museum in Barcelona and an author of one of the new papers. “We lack still an understanding of why these movements were triggered. What happened here, why it happened — it’s strange.”

Modern humans arose in Africa and expanded to other continents about 60,000 years ago. Last year, archaeologists reported what might be the oldest evidence of those humans reaching Europe: a set of 54,000-year-old teeth in a French cave.

When these groups arrived in Europe, Neanderthals had already been living across the continent for more than 100,000 years. The Neanderthals disappeared about 40,000 years ago, perhaps because modern humans outcompeted them with superior tools.

Uncovering the Past, One Discovery at a Time

But the oldest DNA of modern humans in Europe, dating back 45,000 years, undermines such a simple story. It comes from people who belonged to a lost branch of the human family tree. Their ancestors were part of the expansion out of Africa, but they split off on their own before the ancestors of living Europeans and Asians split apart.

These early Europeans have almost no genetic link to younger remains of hunter-gatherers. It appears that the first modern humans in Europe may have disappeared along with the Neanderthals, said Cosimo Posth, a paleogeneticist at the University of Tübingen in Germany and an author on the two papers published Wednesday.

“It’s actually quite interesting that the very first modern humans also had a very hard time to actually survive,” Dr. Posth said.

Before the advent of ancient DNA analysis, archaeologists would give names to cultures based on the styles of the things they made. The oldest modern human culture in Europe is known as the Aurignacians, named for the continent’s oldest figurative cave paintings and sculptures.

About 33,000 years ago, as the climate turned cold, a new culture called the Gravettian arose across Europe. Gravettian hunters made spears to kill woolly mammoths and other big game. They also made so-called Venus figurines that might have represented fertility.

Dr. Posth and his colleagues found DNA in Gravettian remains scattered across Europe. The scientists had expected all of the individuals to have come from the same genetic population, but instead found two distinct groups: one in France and Spain, and another in Italy, the Czech Republic and Germany.

“They were very distinct, and this was a very big surprise to us because they practiced the same archaeological culture,” Dr. Posth said.

Dr. Posth and his colleagues named the western population the Fournol people, and found a genetic link between this group and 35,000-year-old Aurignacian remains in Belgium.

They called the eastern group Vestonice, and discovered that they share an ancestry with 34,000-year-old hunter-gatherers who lived in Russia.

That genetic gulf led Dr. Posth and his colleagues to argue that the Fournol and Vestonice belonged to two waves that migrated into Europe separately. After they arrived, they lived for several thousand years sharing the Gravettian culture but remaining genetically distinct.

“This result is, in my opinion, groundbreaking,” said Anaïs Luiza Vignoles, an archaeologist at the University of Paris who was not involved in the study.

Dr. Vignoles said that archaeologists could now investigate the kind of cultural contacts these two populations had. It’s clear from the new study that they were not isolated entirely from each other. In Belgium, the scientists found 30,000-year-old remains with a mix of Fournol and Vestonice ancestry.

Jürgen Richter, an archaeologist at the University of Cologne who was not involved in the new studies, suggested that in these sporadic contacts between the two peoples, they might have shared cultural ideas and artifacts like fertility figurines. “I’m absolutely not surprised,” he said of the new findings.

About 26,000 years ago, the two groups faced a new threat to their survival: an advancing wall of glaciers. During the Ice Age, from 26,000 to 19,000 years ago, European hunter-gatherers were shut out of much of the continent, surviving only in southern refuges.

Dr. Villalba-Mouco and her colleagues shed light on the refuge of the Iberian Peninsula, the region now occupied by Spain and Portugal, by studying DNA in the teeth of a 23,000-year-old man found in a cave in southern Spain. His DNA revealed that he belonged to the Fournol people who lived in Iberia before the Ice Age. The researchers also found genetic markers linking him to a 45,000-year-old skeleton discovered in Bulgaria.

When the glaciers retreated, some descendants of the Fournol continued living in Iberia. But others expanded north as a new population, which Dr. Posth and his colleagues called GoyetQ2. “It really seems like a peopling of Europe after the last glacial maximum,” he said.

The Vestonice, by contrast, did not survive the Ice Age. When the glaciers were at their most expansive, the Vestonice may have endured for a time in Italy. But Dr. Posth and his colleagues found no Vestonice ancestry in Europeans after the Ice Age. Instead, they discovered a population of hunter-gatherers that appeared to have expanded from the Balkans, known as the Villabruna. They moved into Italy and replaced the Vestonice.

For several thousand years, the Villabruna were limited to southern Europe. Then, 14,000 years ago, they crossed the Alps and encountered the GoyetQ2 people to the north. A new population emerged, its ancestry three parts Villabruna to one part GoyetQ2.

This new people, which Dr. Posth and his colleagues called Oberkassel, expanded across much of Europe, replacing the old GoyetQ2 population.

Dr. Posth speculated that another climate shift could explain this new wave. About 14,000 years ago, a pulse of strong warming produced forests across much of Europe. The Oberkassel people may have been better at hunting in forests, whereas the GoyetQ2 retreated with the shrinking steppes.

To the east, the Oberkassel ran into a new group of hunter-gatherers, who probably arrived from Russia. The scientists named this group's descendants, who lived in Ukraine and surrounding regions, the Sidelkino.

But in Iberia, there were no great sweeps of newcomers replacing older peoples. The Iberians after the Ice Age still carried a great deal of ancestry from the Fournol people who had arrived there thousands of years before the glaciers advanced. The Villabruna people moved into northern Spain, but added their DNA to the mix rather than replacing those who were there before.

When the first farmers arrived in Europe from Turkey about 8,000 years ago, three large groups of hunter-gatherers thrived across Europe: the Iberians, the Oberkassel and the Sidelkino. Living Europeans carry some of their genes, which allowed Dr. Posth and his colleagues to make some educated guesses about the physical appearances of the ancient populations.

The Sidelkino people in the east had genes associated with dark eyes and light skin. The Oberkassel in the west, in contrast, probably had blue eyes and may have had dark skin, although it's harder to be sure of their appearance than the Sidelkino.

These three groups of hunter-gatherers remained isolated from each other for about 6,000 years, until the farmers from Turkey arrived. After this advent of agriculture, the three groups began mixing, the scientists found. It's possible that the spread of farmland forced them to move to the margins of Europe to survive. But over time, they were absorbed into the agricultural communities that surrounded them.

Ludovic Orlando, a molecular archaeologist at Paul Sabatier University in France who was not involved in the new research, said that it was a milestone in the study of early humans. "I was really blown away," he said.

Dr. Orlando said that every continent will likely have its own history of hunter-gatherer migrations. Researchers were able to plumb Europe's history in such great detail because they could take advantage of 150 years' worth of remains that have been stored in museums there.

But he predicted that scientists won't have to dig up a lot of new skeletons on other continents to reconstruct their genetic histories. That's because it is now possible to extract human DNA from cave sediments rather than searching for bones and teeth.

"We cannot develop a Eurocentric vision of the past," Dr. Orlando said.

Please visit the site: <https://www.nytimes.com/2023/03/01/science/dna-hunter-gatherers-europe.html>

AT LONG LAST, A DONKEY FAMILY TREE, **BY FRANZ LIDZ, PHOTOGRAPHS BY** **SAMUEL ARANDA**

In a new study, genetics and archaeology combine to reveal the ancient origins of humanity's first beast of burden.

The donkey is a key, if increasingly marginalized, character in human history. Once venerated, the animal has been an object of ridicule for so long that the word “asinine” — derived from the Latin *asinus*, meaning “like an ass or a donkey” — means “stupid.” Donkeys and donkey work are essential to the livelihoods of people in developing countries, but elsewhere donkeys have all but disappeared.

“I guess that we simply forgot the importance of this animal, probably being blown away by the impact of its close cousin, the horse,” said Ludovic Orlando, director of the Center for Anthropobiology and Genomics of Toulouse in France. “In Europe, the horse provided fast mobility and helped grow crops and make war. I am not sure we can claim that the impact of the donkey was as large.” Compared to horses and dogs, donkeys have received relatively little attention from archaeologists, much less geneticists.

Nonetheless, despite this being the Year of the Rabbit according to the Chinese zodiac, it might just be the Year of the Donkey. The Oscar-nominated film “EO” features as its hero a soulful, barbarously misused donkey. And donkeys star in a major new genetic study published in the journal *Science*; Peter Mitchell, an archaeologist at Oxford who was not involved in the project, called it “the most comprehensive study of donkey genomics yet.”

Dr. Orlando, who has spent years mapping the domestication history of horses, is an author of the paper, which he hopes will jump-start research on the humble donkey and restore some of its dignity. He and researchers from 37 laboratories around the world analyzed the genomes of 207 modern donkeys, living in 31 countries. They also sequenced DNA from the skeletons of 31 early donkeys, some of which date as far back as 4,500 years.

Scholars had previously identified three potential centers of domestication, in the Near East, northeast Africa (including Egypt) and the Arabian Peninsula. But Dr. Orlando's team concluded that donkeys — humanity's first land-based transport — were domesticated only once, around 5,000 B.C., when herders in the Horn of Africa and present-day Kenya began to tame wild asses. That date is about 400 years before the earliest archaeological evidence of tamed donkeys from El Omari, near Cairo, and nearly three millennia before horses were first harnessed.

The period coincided with one where the Sahara grew larger and more arid. Donkeys are especially resistant to drought and tolerant to water deprivation, which has led Dr. Orlando to speculate that they became an indispensable conveyance for herders and their wares. “Finding an auxiliary for transportation in those increasingly difficult conditions probably triggered the domestication process,” he said.

From that point of origin in northeastern Africa, the team then reconstructed the evolutionary tree of donkeys and traced their dispersal routes across the rest of the continent. Donkeys were traded northwest into today's Sudan and onward into Egypt, trotting out of Africa around 5,000 years ago, and splitting off to Asia and Europe some 500 years later. The various donkey populations became progressively isolated by their geographic distance, even though trade resulted in systematic shifts back to Africa. Interbreeding between bloodlines was limited.

A 2004 study, examining a small sample of modern DNA from hundreds of donkeys, had suggested that humans domesticated wild asses twice, in Africa and Asia. The lead researcher, Albano Beja-Pereira, a geneticist at the University of Porto in Portugal, collaborated with Dr. Orlando and his colleague Evelyn Todd to revisit the conclusions using a larger data set, and now agrees with the single domestication hypothesis.

To our ancestors, the donkey assumed an extremely varied mythical and religious dimension. In ancient Egypt, the ass was one of the sacred animals of Seth, the Lord of Chaos. In Greek folklore, a donkey — an equid involved in the harvest and production of wine — was the mount that carried the god Dionysus into battle against the Giants, and flutes fashioned from donkey tibiae (which produced a braying-like sound) were used in his worship.

A human and horse skeleton on view at the Museum of Toulouse. “I guess that we simply forgot the importance of this animal, probably being blown away by the impact of its close cousin, the horse,” Dr. Orlando said of donkeys.

Donkeys are central to Judaic, Christian and Muslim iconography: In the Old Testament, Balaam's ass saw an angel and uttered prophecies. In the New Testament, Jesus entered Jerusalem on a donkey on the day that Christians celebrate as Palm Sunday. Ya'fur was the name of the donkey that the Prophet Muhammad is said to have ridden and conversed with.

During the Bronze Age, from 3300 B.C. to 1200 B.C., donkeys were sometimes buried with humans, indicating a bestowal of honor on both parties. “In other cases, we find them as ritual deposits below floors, as recently discovered at Tell es-Safi, or seemingly as buried in their own right,” said Laerke Recht, an archaeologist at the University of Graz in Austria who also worked on the new paper. She quoted a term that dates back to at least the second millennium B.C.: “to kill a donkey,” which means to sign a treaty, an act that apparently involved a sacrifice.

The new findings revealed a previously unknown lineage of donkeys present in the Levant from around 200 B.C. At an archaeological site on the grounds of a Roman villa in the French village of Boinville-en-Woëvre, 175 miles east of Paris, investigators found what seems to have been a donkey breeding center, where donkeys from western Africa were mated with their European counterparts. The resulting pack animals measured 61 inches, or 15 hands, from the ground to the withers. The current standard is 51 inches or 12 hands. The only comparable modern donkeys are the American Mammoth Jacks — large, robust males bred to produce draft mules or for agricultural work.

Dr. Orlando said that the production of giant-donkey bloodlines occurred at a time when mules — the sterile offspring of male donkeys, or jacks, and horse mares — were vital to the Roman economy and its military. “It wouldn’t take that many generations to selectively breed larger and larger donkeys,” said Dean Richardson, a professor of equine surgery at the University of Pennsylvania School of Veterinary Medicine’s New Bolton Center. “Giant jacks have always been in demand to make more valuable mules.”

It is likely that the Romans preferred mules for their stamina, their speed and their capacity to bear massive loads of goods, especially for the army, which was stretched over thousands of miles. “When the Roman Empire collapsed, there was no incentive left for transportation across those long roads, and societies turned to more local economies,” Dr. Orlando said. “The donkey then became more dominant and mules were hardly ever produced.”

How can you tell that an ancient donkey was broken-in? “Domestication is a process,” said Dr. Mitchell, the Oxford archaeologist and author of “The Donkey In Human History.” Two decades ago at Abydos, in southern Egypt, the skeletons of 10 donkeys, dating from 3100 B.C., were excavated outside the funerary enclosure of the first pharaohs. “The bones showed a clear mosaic of wild and domestic characteristics,” Dr. Mitchell said. “What gave away their domestic status was damage to vertebrae and joints consistent with hauling.”

He said that the paucity of donkey scholarship reflects the out-of-sight, out-of-mind view of Western scientists, since over the last century donkeys and mules have largely vanished from Europe and North America. “Even in the developing world, they are very much an animal associated with the poor and with women more than men — so there’s a double bias against them,” Dr. Mitchell said.

In his 2008 travelogue “The Wisdom of Donkeys,” the British academic Andy Merrifield notes that Benjamin, the skeptical donkey in George Orwell’s “Animal Farm,” desires only to retire to a pasture with his pal, a horse named Boxer. Dr. Merrifield finds in a donkey’s eyes “a touching sadness, a grace,” and a purity that “has no right to exist in the human world.”

Still, the lucrative trade in donkey skins, an often illegal, largely unregulated and expanding global industry, encourages intensive farming to harvest hides, which are boiled down to make ejiao, a gelatin used primarily in traditional Chinese medicines. “This goes so obviously against animal welfare and causes a threat to local donkey populations and to those who depend on this animal for their subsistence,” Dr. Orlando said. “If anything, our work reveals that our relationship with the animal goes really far back in time. This should help us realize the innumerable services they provided to humankind, and hopefully make us grateful.”

Please visit the site: <https://www.nytimes.com/2023/03/14/science/donkeys-genetics-archaeology.html> [Go there for pix]

MAGNETIC FIELDS COULD PROVIDE THE KEY TO STUDYING SUBMERGED CIVILISATIONS

According to Ben Urmston from the University of Bradford, magnetic fields could indicate the presence of archaeological features without the need for exploratory underwater excavations.

Magnetometry has previously been used by terrestrial archaeologists but has not been used extensively to examine submerged landscapes. The pioneering technique could be applied in Doggerland, a submerged land mass beneath what is now the North Sea, that once connected Britain to continental Europe.

The landscape of Doggerland was a diverse mix of gentle hills, marshes, wooded valleys and swamps during the later Palaeolithic and Mesolithic periods. Small groups of hunter-gatherers took advantage of Doggerland's rich migrating wildlife, with evidence of ancient animal bones and tools being brought to the surface by fishing trawlers operating in the North Sea.

Over time, the area was flooded by rising sea levels after the last glacial period around 6,500 to 6,200 BC. Melting water that had been locked away caused the land to tilt in an isostatic adjustment as the huge weight of ice lessened.

Doggerland eventually became submerged leaving only Dogger Bank, a possible moraine (accumulation of glacial debris) which also succumbed to the sea around 5000 BC.

According to Urmston: "Small changes in the magnetic field can indicate changes in the landscape, such as peat-forming areas and sediments, or where erosion has occurred, for example in river channels. As the area we are studying used to be above sea level, there's a small chance this analysis could even reveal evidence for hunter-gatherer activity."

"We might also discover the presence of middens, which are rubbish dumps that consist of animal bone, mollusc shells and other biological material that can tell us a lot about how people lived," added Urmston.

Such features could be analysed closer by taking samples of the seabed which are then sent for carbon dating and a microscopic analysis.

Professor Vince Gaffney, academic lead for the project, said: "Exploring the submerged landscapes beneath the North Sea represents one of the last great challenges to archaeology. Achieving this is becoming even more urgent with the rapid development of the North Sea for renewable energy."

Please visit the site: <https://www.heritagedaily.com/2023/03/magnetic-fields-could-provide-the-key-to-studying-submerged-civilisations/146463> Go there for maps

CONTEST LAUNCHED TO DECIPHER HERCULANEUM SCROLLS USING 3D X-RAY SOFTWARE, BY IAN SAMPLE

Global research teams who can improve AI and accelerate decoding could win \$250,000 in prizes

The eruption of Mount Vesuvius in AD79 laid waste to Pompeii and nearby Herculaneum where the intense blast of hot gas carbonised hundreds of ancient scrolls in the library of an enormous luxury villa.

Now, researchers are launching a global contest to read the charred papyri after demonstrating that an artificial intelligence programme can extract letters and symbols from high-resolution X-ray images of the fragile, unrolled documents.

Scientists led by Prof Brent Seales, a computer scientist at the University of Kentucky, were able to read the ink on surface and hidden layers of scrolls by training a machine-learning algorithm to spot subtle differences in the papyrus structure captured by the X-ray images.

“We’ve shown how to read the ink of Herculaneum. That gives us the opportunity to reveal 50, 70, maybe 80% of the entire collection,” said Seales. “We’ve built the boat. Now we want everybody to get on and sail it with us.”

For the Vesuvius challenge, Seales’s team is releasing its software and thousands of 3D X-ray images of two rolled-up scrolls and three papyrus fragments. The hope is that \$250,000 (£207,800) in prizes attracts global research groups who can improve the artificial intelligence and accelerate the decoding of the only intact library to survive from antiquity.

“We’re having a competition so we can scale up our ability to extract more and more of the text,” Seales said. “The competitors will be standing on our shoulders with all of our work in hand.”

Teams that enter will compete for a grand prize of \$150,000, awarded to the first to read four passages of text from the inner layers of the scrolls before the end of 2023. Progress prizes include \$50,000 for accurately detecting ink on the papyri from the 3D X-ray scans.

The two unopened scrolls belong to the Institut de France in Paris and are among hundreds discovered in the 1750s when excavations at the buried villa revealed a lavish library of Epicurean philosophical texts. The enormous building is thought to have belonged to a wealthy Roman statesman, possibly Lucius Calpurnius Piso Caesoninus, the father-in-law of Julius Caesar.

The Roman town of Herculaneum near Naples, Italy, buried by Vesuvius in AD79.
Photograph: porojnicu/Getty/iStockphoto

While the black ink used to write the scrolls cannot be seen on the charred papyri, infrared images of surface fragments have revealed Greek letters and symbols. Armed with these and X-ray images of the same fragments, Seales's team trained their algorithm to read the lettering from X-ray images alone. Once trained, the algorithm could then spot new text in hidden layers of the tightly wrapped scrolls.

“A human cannot pick this out with their eye,” Seales said. “The ink fills in the gaps that otherwise create a waffle-like pattern of the papyrus fibres. That pattern gets coated and filled in and I think that subtle change is what's being learned.”

The majority of Herculaneum scrolls analysed so far are written in ancient Greek, but some might contain Latin texts. There could also be poems by Sappho or the treatise Mark Anthony wrote on his drunkenness. Seales hopes to find evidence of early Christian philosophy. “While others would love to see some of the lost work of the ancients, what I'd like to see is evidence of the turmoil that was happening in the first century around the development of Christianity and the Judeo-Christian tradition as it was evolving.”

Stephen Parsons, a PhD candidate on the team, said the technology was at the very limit of being able to read the ink and that improvements from competitors could lead to dramatic gains in understanding the scrolls. Fragments analysed so far have revealed letters from Philodemus's work, *On Vices and the Opposite Virtues*, and others from a scroll about Hellenistic dynastic history.

“I love to wonder what's in there and I love to imagine the human beings who made these things,” Parsons said. “It's an incredible moment to have been the person to unveil some of this text. Even if it's only one or two characters, that's something a human hand wrote nearly 2,000 years ago and went unseen until I saw it on my computer screen, sitting at my desk or on my couch. For me, that's an unforgettable moment of connection across time.”

Tobias Reinhardt, professor of the Latin language and literature at the university of Oxford, said: “To me the idea that getting more people with the right expertise to think about these problems is compelling. The competition promises to be a more effective tool for attracting attention from what is a vast and fast-evolving field than approaches to individual researchers and companies.”

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Please visit the site: <https://www.theguardian.com/technology/2023/mar/15/contest-decipher-herculaneum-scrolls-3d-x-ray-software>

DEEP DIVE: ARCHAEOLOGISTS UNCOVER OLDEST GULF PEARLING TOWN IN UAE, BY JON GAMBRELL

Village in Siniyah Island in Umm al-Quwain dates back to late 6th century, before the spread of Islam; researchers find loose pearls and diving weights inside ancient homes

SINIYAH ISLAND, United Arab Emirates (AP) — Archaeologists said Monday they have found the oldest pearling town in the Persian Gulf on an island off one of the northern sheikhdoms of the United Arab Emirates.

Artifacts found in this town on Siniyah Island in Umm al-Quwain, likely once home to thousands of people and hundreds of homes, date as far back as the region’s pre-Islamic history in the late 6th century.

While older pearling towns have been mentioned in historical texts, this represents the first time archaeologists say they have physically found one from this ancient era across the nations of the Persian Gulf.

“This is the oldest example of that kind of very specifically Khaleeji pearling town,” said Timothy Power, an associate professor of archaeology at the United Arab Emirates University, using a word that means “Gulf” in Arabic. “It’s the spiritual ancestor of towns like Dubai.”

The pearling town sits on Siniyah Island, which shields the Khor al-Beida marshlands in Umm al-Quwain, an emirate some 50 kilometers (30 miles) northeast of Dubai along the coast of the Persian Gulf.

The island, whose name means “flashing lights” likely due to the effect of the white-hot sun overhead, already has seen archaeologists discover an ancient Christian monastery dating back as many as 1,400 years.

This handout photo shows an ancient Christian monastery uncovered on Siniyah Island in Umm al-Quwain, United Arab Emirates, in March 2022. (Nasser Muhsen Bin Tooq/Department of Archaeology and Tourism of Umm al-Quwain via AP)

The town sits directly south of that monastery on one of the curling fingers of the island and stretches across some 12 hectares (143,500 square yards). There, archaeologists found a variety of homes made of beach rock and lime mortar, ranging from cramped quarters to more sprawling homes with courtyards, suggesting a social stratification, Power said. The site also bears signs of year-round habitation, unlike other pearling operations run in seasonal spots in the region.

“The houses are crammed in there, cheek by jowl,” he added. “The key thing there is permanence. People are living there all year around.”

In the homes, archaeologists have discovered loose pearls and diving weights, which the free divers used to quickly drop down to the seabed while relying only on their held breath.

The town predates the rise of Islam across the Arabian Peninsula, making its residents likely Christians. Islam's Prophet Muhammad was born around 570 and died in 632 after conquering Mecca in present-day Saudi Arabia.

Umm al-Quwain's Department of Tourism and Archaeology, UAE University, the Italian Archaeological Mission in the emirate and the Institute for the Study of the Ancient World at New York University all took part in the excavation. Umm al-Quwain, the least-populated emirate in the UAE, plans to build a visitor's center at the site.

Today, the area near the marshland is more known for the low-cost liquor store at the emirate's Barracuda Beach Resort. In recent months, authorities have demolished a hulking, Soviet-era cargo plane linked to a Russian gunrunner known as the "Merchant of Death" as it builds a bridge to Siniyah Island for a \$675 million real estate development. Authorities hope that development, as well as other building, will grow the emirate's economy.

However, even this ancient site bears lessons for the Emirates.

The story of pearling, which rapidly collapsed after World War I with the introduction of artificial pearls and the Great Depression, holds particular importance in the history of the UAE — particularly as it faces a looming reckoning with another extractive industry.

While crude oil sales built the country after its formation in 1971, the Emirates will have to confront its fossil fuel legacy and potentially plan for a carbon-neutral future as it hosts the United Nations COP28 climate talks later this year.

Those searching the site found a dumpsite nearby filled with the detritus of discarded oyster shells. People walking across the island can feel those remains crunching under their feet in areas as well.

"You only find one pearl in every 10,000 oyster shells. You have to find and discard thousands and thousands of oyster shells to find one," Power said. "The waste, the industrial waste of the pearling industry, was colossal. You're dealing with millions, millions of oyster shells discarded."

Please visit the site: <https://www.timesofisrael.com/deep-dive-archaeologists-uncover-oldest-gulf-pearling-town-in-uae/> [Go there for pix]

EVIDENCE OF BRAIN SURGERY **PERFORMED 3,000 YEARS AGO** **DISCOVERED IN THE ANCIENT CITY OF** **TEL MEGIDDO**

Researchers have discovered a rare instance of delicate cranial surgery, possibly the earliest of its kind in the Middle East, in a Late Bronze Age grave at the Megiddo archaeological site in Israel.

For thousands of years, people have practiced cranial trephination, a medical procedure that involves cutting a hole in the skull, according to archaeologists. They've turned up evidence that ancient civilizations across the globe, from South America to Africa and beyond, performed the surgery.

In 2016, archaeologists excavated a pair of tombs in the domestic section of a palace in the famous Biblical city Megiddo, uncovering the remains of two brothers, individuals buried together nearly 3,500 years ago.

Now, researchers from the United States and Israel have published the findings of an analysis of their skeletons, revealing a tragic story of two brothers whose wealth was insufficient to save them from an early death.

The findings mark the earliest example of trephination, a surgical procedure of creating a hole in the skull without affecting underlying tissue, the outlet further said. The brothers lived between 1550 BC and 1450 BC.

The remains of two brothers were found in a Bronze Age tomb in the city of Tel Megiddo, Israel. Photo: Journal Plos

The older brother, who is thought to be between the ages of 20 and 40, had signs of surgery on his skull. The archaeologists said that after cutting off his scalp, a square piece of his skull was removed from his frontal bone using a sharp instrument.

Study lead author Rachel Kalisher is quoted by CNN as saying in a statement, "We have evidence that trephination has been this universal, widespread type of surgery for thousands of years."

Ms Kalisher said she initially thought the skull fragment had been taken as a DNA sample by colleagues.

"Usually when you study human remains, you're studying the accumulated change that they experienced throughout their lives, but this was one moment captured," she added.

The study detailing the discovery has been published in the journal PLOS ONE.

Megiddo, 130 kilometers (80 miles) north of Jerusalem, was a thriving urban center with numerous palaces, fortifications, and temples. Many will recognize it by its Greek name, Armageddon, which is prophesied to be the site of the final battle before the end times.

Please visit the site: <https://arkeonews.net/evidence-of-brain-surgery-performed-3000-years-ago-discovered-in-the-ancient-city-of-tel-megiddo/> [Go there for pix]

ARCHAEOLOGISTS DEVISE A BETTER CLOCK FOR BIBLICAL TIMES, BY FRANZ LIDZ

A new approach to studying the history of Old Testament conflicts, courtesy of Earth's geomagnetic record.

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When it comes to assigning dates to military campaigns described in the Bible, the parameters of the debate take on almost biblical proportions. Exactly when did the Amalekites wage war against the Hebrews in the wilderness? Did Joshua fight the Battle of Jericho in 1500 B.C. or in 1400 B.C. — or at all?

Such uncertainty exists, in part, because the radiocarbon analysis that scientists use to date organic remains is less accurate for certain epochs. And, in part, because archaeologists often disagree over what the timelines for different narratives should be. But a new technique, which makes use of consistently reliable geomagnetic data, allows scientists to study the history of the Levant with greater confidence.

Many materials, including rocks and soils, record the reversals and variations over time in earth's invisible geomagnetic field. When ancient ceramics or mud bricks that contain ferromagnetic, or certain iron-bearing, minerals are heated to sufficiently high temperatures, the magnetic moments of the minerals behave like a compass needle, reflecting the orientation and intensity of the field at the time of burning. The new methodology can provide a sort of geobiblical clock.

“Based on the similarity or difference in the recorded magnetic signals, we can either corroborate or disprove hypotheses” about when certain layers of sediment might have been destroyed during biblical battles, said Yoav Vaknin, a doctoral candidate at Tel Aviv University and the Hebrew University at Jerusalem, who pioneered the technology. “It all fits together perfectly, better than I had ever imagined.”

Mr. Vaknin's research, published this year in the Proceedings of the National Academy of Sciences, harnesses information from 20 international scholars to map out a geomagnetic data set of 21 layers of historical destruction across 17 sites in the Holy Land.

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The project is an attempt to check the historical authenticity of Old Testament accounts of the Egyptian, Aramaean, Assyrian and Babylonian offensives against the Kingdoms of Israel and Judah, and conflicts between these two realms. For those readers without a scorecard, the principals included Shoshenq I (1 Kings 14: 25-26), Hazael (2 Kings 12:18), Jehoash (2 Kings 14:11-15), Tiglath-pileser III (2 Kings 15:29), Sennacherib (2 Kings 18-19) and Nebuchadnezzar (2 Kings 25:1-21).

“With this new data set, we can narrow things down to a decadal level,” said Thomas Levy, an archaeologist at the University of California, San Diego, who was not involved with the study. “That is super important when trying to connect ancient historical events to the archaeological record.”

The real significance of the research is in the interdisciplinary connections, said Oded Lipschits, an archaeologist and one of the study’s co-authors: Experts in the new technique, known as archaeomagnetism, gain “chronological anchors” from the work of archaeologists — footholds in the historical timeline. “And in return, archaeology gets a new tool for dating, whose main application is in the first millennium B.C., a period when radiocarbon is less effective and impossible to rely on.”

The study stands apart not only for its content, but also for its researchers. All but one of the study’s authors are archaeologists — many of them with contradictory views on biblical history and the chronology of the period.

Rather than provide absolute dates, Mr. Vaknin’s database compares magnetic readings of burned materials at various sites. Where historical evidence has already established precise timelines, nearby sites can also be dated.

To understand the mysterious mechanism of earth’s magnetic field, geophysicists track its changes throughout history by using archaeological relics — furnaces, ceramic shards and roof tiles — that contain ferromagnetic minerals.

In a 2020 paper, Mr. Vaknin and his colleagues used floor fragments and smashed pottery from a large, two-story building excavated in a Jerusalem parking lot to recreate Earth’s magnetic field, as it was on the ninth of the Hebrew month of Av, 586 B.C., which is recognized as the date when Nebuchadnezzar and his Babylonian army annihilated the First Temple and the city of Jerusalem.

The more recent study reconstructed the magnetic field recorded in burned remains at biblical sites in present-day Israel that were razed by fire. Using archaeomagnetic readings that have been preserved for millennia in mud bricks, in a mud beehive and in two collections of ceramic objects and historical information from ancient inscriptions, the team analyzed layers of ruin left behind by military conflicts.

The findings help settle a longstanding debate over how exactly the Kingdom of Judah fell and disproves claims that the ancient settlement of Tel Beit She’an, a magnet for conflagrations and epic sieges, was razed in the ninth century B.C. by the Aramaean armies of Hazael of Damascus. Magnetic dating indicates instead that Beit She’an was burned to the ground some 70 to 100 years earlier; this links the destruction to the Egyptian pharaoh Shoshenq, whose campaign was described in the Hebrew Bible and in an inscription on a wall of the Temple of Amun in Karnak, Egypt, which mentions Beit She’an as one of the king’s conquests.

Curiously, other data indicate that, about a century later, Hazael’s soldiers set fire to several settlements: Tel Rehov, Tel Zayit and Horvat Tevet, in addition to Gath, one of the five royal cities of the Philistines (and home to Goliath), whose destruction is noted in 2 Kings 12:17. The study, which examined the geomagnetic records at all four sites at

the time of demolition, strongly suggests that they were burned during the same military offensive, according to the researchers.

Mr. Vaknin spent four years pioneering the application of paleomagnetic research to biblical archaeology, aided by his doctoral advisers, Dr. Lipschits, Erez Ben-Yosef of Tel Aviv University and Ron Shaar of the Institute of Earth Sciences at the Hebrew University of Jerusalem.

Besides helping to date archaeological contexts, the technology provides invaluable information on Earth's magnetic field, one of the most enigmatic phenomena in geoscience. "Since instrumental recording of the field started about 200 years ago, the field's strength has declined, and there is a danger that we might lose it completely," Dr. Ben-Yosef said. "Understanding this trend and how dangerous it is requires data on the past behavior of the field."

Earth's magnetosphere is a protective bubble that deflects solar winds, streams of charged particles from the sun that gust through the solar system, and cosmic rays from deep space. Scientists theorize that the magnetic field is generated by a layer of molten iron and nickel in the planet's outer core, about 1,800 miles below the surface, that is in continual flux around a solid iron core. As ferromagnetic particles in ancient artifacts cool, their magnetic moments are baked into the alignment. So long as the objects don't heat up again, they will retain what is effectively a fossilized magnetic field. Each reheating beyond a certain temperature wipes out all previously recorded magnetic signals, so that the date is always of the most recent firing.

From around 800 to 400 B.C., as a result of changes in the percentage of radiocarbon in the atmosphere, the resolution of radiocarbon dating during those years is so limited that archaeologists seldom use it.

Dr. Ben-Yosef said he hoped that the new dating method would finally settle questions about the fall of the Kingdom of Judah. While it is widely accepted that the Babylonians laid waste to the Judean polity in 586 B.C., some researchers, relying on historical and archaeological evidence, argue that the invaders were not solely responsible. The intensity of the magnetic field as recorded in the destruction layer of the site of Malhata — a city on the southern periphery of Judah — is different and significantly lower than the one recorded in the Babylonian destruction of Jerusalem, the capital of the kingdom." This means that the two destructions cannot be related to the same event," Dr. Ben-Yosef said.

The archaeomagnetic data provided clear evidence that Malhata was destroyed decades later, a scenario that fits the notion that the Edomites, Judah's southern neighbors, took advantage of the weakness of the Judahites after the Babylonian attack, decimated their southern cities and raided their territory.

"These events are reflected in the Hebrew Bible," Dr. Ben-Yosef said.

"They explain the animosity toward the Edomites by several prophets, notably Obadiah."

Scholars who had partly absolved the Babylonians should feel vindicated, he added. "Now, the magnetic results support their hypothesis. The big deal about this research is that after decades of work on establishing a reference database, we finally reap the fruits

of our labor, and what we saw has become a potent dating tool in biblical archaeology that, undoubtedly, will become part of the tool kit of archaeologists working in the Holy Land.”

A version of this article appears in print on Dec. 20, 2022, Section D, Page 3 of the New York edition with the headline: A Superior Clock For Biblical Times.

Please visit the site: <https://www.nytimes.com/2022/12/20/science/archaeology-bible-geomagnetism.html> [Go there for pix]

DIGITALLY REBUILDING A LOST CITY, **BY WILLIAM WEIR**

Yale computer scientists, archaeologists, and historians are teaming up to uncover long-lost clues from the ancient city of Dura-Europos.

The ancient city of Dura-Europos, on the bank of the Euphrates River in present-day Syria, has long fascinated archaeologists and historians for its cultural diversity — Jewish, Christian, Mithraic, and other religious groups lived and worshiped close to each other.

Even the graffiti that archaeologists uncovered revealed an impressive mix of languages — Greek, Latin, Parthian, Aramaic, Hebrew, and Middle Persian among them.

All of which makes it a rich area of study, especially since there are thousands of artifacts and documents from the site, which has been threatened by looting and conflict in recent years. The city, founded in 300 BC and abandoned in the third century AD, wasn't considered a major metropolis, but historians say its artifacts could tell volumes about the everyday lives of people from that time and region. But because these artifacts are located in numerous locations and are often unmarked or have multiple labels, it is extremely difficult for researchers to study them.

Holly Rushmeier, the John C. Malone Professor of Computer Science, and Anne Chen, a postdoctoral associate at ARCHAIA, an interdisciplinary program at Yale for the study of ancient and premodern cultures, are working to change that. They recently received a \$350,000 grant from the National Endowment for the Humanities to develop a digital archive of materials related to the archaeological site of Dura-Europos. They will create a virtual data cloud known as “linked open data” to bring together the disparate materials from this region. This will create a user-friendly interface that allows researchers to access the data, as well as add their own contributions.

“The linked open data will make it accessible, so you can search across all the collections and find the stuff that is really important,” Rushmeier said.

The digital archive will also make it easier for researchers to find what they're looking for in the rather dense excavation records. For instance, they'll be able to map out the thousands of objects in Yale's possession and identify where on the site they were originally found.

“Then, from that, scholars can start looking at interpreting what that means about everyday life,” Rushmeier said.

And they hope to eventually create 3D reconstructions of the city based on the many images they have. For instance, she said, reconstructing spaces of worship like the Mithraeum of Dura-Europos, the Baptistery, and the synagogue could help researchers better understand how they were used.

Part of the challenge with the current collection can be chalked up to the convoluted process of excavating the site, which began 100 years ago. There were three phases of the

historic excavations. First, a British team came in to do some initial exploratory work but fled within 24 hours because it was a war zone at the time. A Belgian archaeologist headed up a French expedition a couple years later, but it again became a difficult place to work. And five years later in 1922, Yale researchers teamed up with French archaeologists for a more in-depth, collaborative excavation.

Yale researchers began excavation at Dura-Europos in 1922.

The collection is particularly valuable to history because much of what we know about it isn't through texts, but from the excavated artifacts. For instance, the director of the Yale excavation found evidence in the 1930s that Dura-Europos was the site of one of the earliest known instances of a gas attack. We only know this by what was found at the site, including a coin that revealed when it happened, and chemical tests done on excavated walls.

“They tunneled under the city, under the walls and set off gas that poisoned people,” Rushmeier said. “So, it’s an interesting place because a lot of what we know about it is from objects rather than written history.”

At the time, institutions responsible for an excavation would often split the materials among themselves, so about half of the material came back to Yale. Much of the rest is in Damascus, and the Louvre in France has a relatively substantial collection. Other artifacts, mostly gifts from Yale, are scattered at various North American institutions. Yale’s share of the collection is found at different campus locations. The Yale Art Gallery holds most of the objects and the historic photographs. Beinecke Library has about 100 of the objects. One cuneiform tablet that was found at Dura-Europos is in the Babylonian collection and can be found at the Peabody Museum.

“This is another reason why this is a great test case for linked open data, because even if we didn’t go beyond the Yale aegis, we can demonstrate how for the first time, we could make Beinecke materials speak to Peabody materials, speak to Yale Art Gallery materials,” Chen said.

Making things even more confounding for researchers is the turnover among curators over 100 years at all these locations, as well as all the different styles in record-keeping.

And then there are sites with multiple names. For instance, the first building that was excavated at the site is a house of worship that’s been known as the Temple of Bel, the Temple of the Palmyrene Gods, the Temple of Jupiter, and the Temple of the Oriental Gods. And that’s just in English. None of the materials that are in Western collections have ever been searchable in Arabic.

In three years, they hope to make the full collection searchable, with Arabic translations throughout. They also want to create a user-friendly website that allows visitors to easily toggle between English and Arabic, allowing researchers all over the world access to the collection to contribute their own expertise to the site.

They’re also aiming to use technologies developed in Rushmeier’s lab to build 3D models and other forms of geospatial reconstruction from photographs in the archive.

“So, if my group could do something to kind of presort the material in a way that then Holly and her students could batch the material and process it for 3D modeling, then great things could happen,” Chen said.

Clockwise from top left: Artifacts catalogued by the researchers include the Coins of Antiochus I Soter, Seleucid King from Dura; the only known surviving example of the semicylindrical shield known as a scutum, used by Roman legionaries; and the Cult Relief of Mithras Slaying the Bull. All are in the Yale University Art Gallery collection.

In addition to that project, Rushmeier and Chen also co-taught a course in spring of 2022, Introduction to the Digital Humanities for the Premodern World, which introduced students to various digital humanities methods and tools for studying the premodern world. Student teams created multidisciplinary projects related to the Dura-Europos site.

“We had a mix of computer science students and humanities graduate students taking the class together,” Rushmeier said. “We can do these interesting interdisciplinary courses that we’re really excited about in computer science, connecting things up to a lot of different areas.”

The class broke into teams, each having students from both computer science and the humanities. A humanities graduate student would pose questions or suggest topics to study, and then the computer science students developed techniques to move the project forward.”

One group developed a searchable database for the different examples of graffiti found at the site, with translation of the texts. Another group of students supplemented the content with information provided by the inscriptions for artifacts in museum exhibits. They also developed a QR code that visitors would scan with their phones and made use of the linked open data to access much more information about the items in the exhibit.

Strewn throughout the city of Dura-Europos were hordes of coins that residents hid whenever the city was attacked or some other crisis arose. A student team created a mapping device that shows their locations as well as some statistical analysis about the weights and origins of the coins.

Digitally organizing and reconstructing a collection from more than 2,000 years ago is an ambitious undertaking, but with the right technology and multiple disciplines working on it, Rushmeier is optimistic that it will soon be a valuable tool for researchers studying this remarkable site.

“With these multidisciplinary projects, we see how much we can push forward both to demonstrate things that can be done and surfacing these new questions that are opportunities for future research,” she said.

Please visit the site: <https://news.yale.edu/2022/12/13/digitally-rebuilding-lost-city>

IN A ROMAN TOMB, ‘DEAD NAILS’ REVEAL AN OCCULT PRACTICE, BY FRANZ LIDZ

Forty-one bent or twisted iron nails, unearthed from a second-century imperial burial site, were meant to keep the deceased in their place.

When it came to the treatment of diseases, the ancient Romans had no shortage of magical remedies, several of which involved iron nails. To cure epilepsy, the first-century historian Pliny the Elder advised driving a nail into the ground at the spot where the afflicted person’s head lay at the start of the seizure. The Romans hammered nails into doors to avert plagues and pounded coffin nails into thresholds to keep nightmares at bay. Nails from tombs and crucifixions were sometimes even worn around the neck as talismans against fevers, malaria and evil spells.

Recently, archaeologists excavated an unusual set of talismanic nails from a mountaintop necropolis on the outskirts of Sagalassos in southwestern Turkey. In an early Roman imperial tomb, 41 broken nails were found scattered among the cremated remains of an adult male who had lived in the second century A.D. and was buried in situ. Twenty-five of the nails were headless and deliberately bent at right angles; the others were complete roundheaded nails with the shanks twisted multiple times. The unusual funerary practice is the subject of a new study published in the journal *Antiquity*.

“The nails were not used in the construction of the pyre, and had no practical purpose,” said Johan Claeys, an archaeologist at Catholic University Leuven and the lead author of the paper. “They would have been valuable enough to be recovered if still serviceable. But they were dead nails, and the way they were distributed around the perimeter of the tomb suggests that the placement was purposeful.” By “dead nails,” he meant that they had been believed to possess occult power.

At the time, the ashes and unburned remnants of cremated bodies were commonly put in an urn and buried in a grave or placed in a mausoleum. In this case, the pyre was carefully sealed beneath a raft of two dozen bricks, arranged in four rows. The undersides of the bricks were discolored, indicating that they had been set atop the still-smoldering embers. The bricks were then slathered with slaked lime.

“This wasn’t the thin, temporary layer normally used to cover the skeletal remains before they were recovered for burial,” Dr. Claeys said. “This lime was thick and secured the remains as much as a solid coffin would have.” Lime, he said, was seldom applied during Roman-era interments. Indeed, of the 180 or so tombs that his team examined at the cemetery, this was the only one that had been limed.

Each of these three features — the nails, the bricks and the lime — has been found in other graves in the ancient Mediterranean, but this was the first time they had been seen together, Dr. Claeys said. This strongly implied the use of protective charms to keep the “restless dead” from interfering with the living, he said.

“Whether or not the cause of the man’s death was traumatic, mysterious or the result of a contagious illness or punishment, it appears to have left the mourners fearful of his

return,” he said. “We are witnessing here at least three deviant interventions that each in and of themselves can be understood as means to pin the deceased to his final resting position. The combination swings the pendulum firmly toward safeguarding the living from the dead.”

The new study provided significant evidence that “protective magic” was used in Imperial Rome necropoli, said Silvia Alfayé, a professor of ancient history at the University of Zaragoza, Spain, who was not involved in the project. “The Sagalassos cremation tells us a personal but also social story of care, hope, contempt, respect, grief and fear facing loss,” she said. “It reveals the choice of magic as the most suitable ritual technology to manage death anxiety and phantom menaces.”

Yo, Hadrian

Sagalassos was built on the slopes of the Taurus mountain range, about 5,000 feet above sea level, in the late fifth century B.C., when the region was part of the Achaemenid Empire. Captured in 333 B.C. by Alexander the Great on his march through coastal Anatolia, Sagalassos was loosely governed from afar, if at all, by members of his ruling clique and their descendants: Antigonos the One-Eyed, possibly Lysimachus of Thrace, and the Seleucids of Syria, who are credited with urbanizing the area.

By the second century B.C., Sagalassos had become a city-state of the Hellenistic Attalid Kingdom. With the death of King Attalus III in 133 B.C., the settlement was bestowed on the Roman Republic and, a century later, incorporated into the Empire. The bustling metropolis was later favored by the emperor Hadrian (117 A.D. to 138 A.D.), who named it the regional center of the imperial cult.

In late antiquity, Sagalassos, though still dynamic and resilient, faded in importance. From the sixth century A.D. on, it suffered an earthquake, a recession, epidemics and an invasion until it was abandoned in the 13th century. Largely protected from looting and vandalism by its extreme isolation, Sagalassos today remains remarkably well-preserved, with a library, an odeon and outdoor theater, two large bath complexes, a 60-room mansion, a monumental fountain and colossal statues of Hadrian, fellow emperor Septimius Severus and empress Faustina the Elder.

Archaeologists from Catholic University have been systematically excavating the area around Sagalassos since 1990. In 2011, they began a fresh exploration of the city’s northeastern edge, a kind of premature suburban sprawl originally dedicated to agricultural terracing that had been converted for funerary and artisanal purposes. The dig uncovered relics, intact burials and traces of cremation pyres spanning six centuries.

“As Sagalassos belonged to the Greek-speaking parts of the Roman Empire, many of their funerary practices are more Greek in nature than Roman,” said Sam Cleymans, an anthropologist at the Gallo-Roman Museum in Belgium who also worked on the new paper.

The so-called dead nails turned up in 2012. Dr. Cleymans, then a student doing fieldwork at the site, remembered reading a short description of nails that had been strewn around burials in the Roman necropolis of Blicquy in Belgium. “The account mentioned that some were bent and did not seem to have had a use as coffin nails,” he said. “The author

interpreted these nails as a way to bind the spirits of the dead to the grave to keep them from wandering around.”

According to Dr. Alfayé, the idea behind bent and broken nails was to erect a two-way barrier that would shield both the dead and the living.

“These rituals were aimed at hermetically locking the grave and securing it against invasive threats such as robbery, vandalism and witchcraft, as well as blocking the possible escape of a runaway revenant,” she wrote in an email. “In the ancient Roman mind-set, nails, whether bent or twisted or decapitated, were invested with magical potency. The ones from graveyards were considered best for neutralizing supernatural harm by transferring their dead provenance to the evil and killing it.”

A coin for Charon

Nails aside, Dr. Claeys said, the Sagalassos cremation was performed with at least some of the traditional funerary rites that might be expected from ancient sources and archaeological parallels.

Although whoever buried the man may have feared him, they clearly put care into the process. The tomb was respectfully furnished with worldly goods such as baskets, perfume bottles, clothing, ceramic urns, vessels containing grains and nuts, and Charon’s obol, a coin placed in the mouth or near the body of the dead to ensure safe passage to the Underworld.

The researchers could not ascertain whether relatives of the departed were buried nearby. Kinship typically can be established only through inscriptions or DNA analysis. None of the Sagalassos graves bore epitaphs, and genetic material is often destroyed by high temperatures in ancient cremations. “Teeth, especially molars, are arguably the best source for the extraction of DNA,” Dr. Claeys said. “We did not recover any molars.”

On the other hand, he added, the cremation took place close to the eastern edge of the team’s excavation trench. “Who knows what lies just a few meters more to the east?” Dr. Claeys said. He is concerned that while extending the trench might provide answers, it could just as easily open up a whole set of new questions.

“At some point you have to make choices, ideally based on research questions, but time and financial constraints will also play their part,” he said. “The basic principle is that it is better to leave the archaeological record untouched as long as it is not threatened, which explains the often limited interventions we undertake in Sagalassos.”

Dr. Alfayé is fond of the Spanish expression “dar en el clavo” — to hit the nail on the head. “The meaning is to find the clue, discover something,” she said. In the ancient cemeteries of Sagalassos, something is always waiting to be discovered.

A version of this article appears in print on March 28, 2023, Section D, Page 1 of the New York edition with the headline: ‘Death Nails’ in Tomb Reveal Occult Practice.

Please visit the site: <https://www.nytimes.com/2023/03/25/science/archaeology-ancient-rome-tomb.html> [Go there for pix]

VATICAN RETURNS ANCIENT PARTHENON MARBLE FRAGMENTS TO GREECE

Greece said that they hope the return of the fragments by the Vatican will lead to the British Museum making a similar gesture in the near future.

The return of three 2,500-year-old marble pieces of statues that once adorned the Parthenon in Greece's capital of Athens was celebrated in a ceremony on Friday.

The event, held in the new home of the marble pieces, the Acropolis Museum, was led by Greece's Culture Minister Linda Mendoni, the leader of the Greek Orthodox Church Archbishop Ieronymos II. and the Vatican secretary for promoting Christian unity, Bishop Brian Farrell, according to Deutsche Welle.

According to the Vatican Museums website, one piece returned to Greece is the head of the horse that was depicted pulling Athena's chariot on the west side of the building. The others are from the head of a boy and the head of a bearded male, respectively.

The dignitaries exchanged handshakes and smiled for the cameras, but also called to return the rest of the sculptures. "This act by Pope Francis is of historical significance and has a positive impact on all levels... We hope it sets an example for others," Archbishop Ieronymos II said.

The return of the marble shards that had been stored in Vatican museums for centuries was announced by Pope Francis last year, the BBC had reported.

Greece's Orthodox Church, Ieronymos II and Bishop Brian Farrell, Secretary of the Pontifical Council for Promoting Christian Unity, attend a ceremony to mark the return of three Parthenon fragments from the Vatican, at the Parthenon Gallery of the Acropolis Museum, in Athens, Greece March 24, 2023. (credit: REUTERS/LOUIZA VRADI)

In his address at the signing ceremony a few weeks ago, the governor of Vatican City, Cardinal Fernando Vergez, said the three pieces were acquired by the papacy "correctly" at the start of the 19th century.

"The gifting of fragments of the Parthenon which had been held in the Vatican Museums for more than two centuries shows itself as a cultural and social gesture of friendship and solidarity with the people of Greece," Bishop Farrell said.

Calls grow for British Museum to return sculptures

About 50% of the original sculptures that once adorned the Parthenon building survived to the present day, half of them now residing in the British Museum in London.

"The ceremony today... similar to the gesture by the government of Sicily and the Republic of Italy a few months ago, shows the road that we could follow, that everyone could follow, in order for the unity of the Parthenon to be restored," Greece's culture minister Linda Mendoni added.

Greece "cannot recognize possession and ownership by the British Museum because it considers the sculptures to be there as a product of theft," Mendoni said.

The sculptures that are now in the British Museum were taken to Britain by diplomat Lord Elgin in the 19th century, before the Greek independence from the Ottoman Empire.

Greece has been calling for the return of the sculptures from London for years, arguing that they are part of the country's heritage.

Mendonis proposed that Greece could lend the British Museum other ancient Greek artifacts to "fill the gap" if the Parthenon fragments were returned, because of a legal question over recognition either of ownership or exchange in any possible accord.

The Vatican had circumvented the issue by describing its gesture as an "ecumenical donation" to Greece and its Orthodox Church.

Please visit the site: <https://www.jpost.com/international/article-735372>
