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

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

Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Ιούνιος 2020 -

The key is to keep company only with people who uplift you, whose presence calls forth your best. (*Epictetus*)

Newsletter of the Hellenic Society of Archaeometry

- June 2020 -

Nr. 231

ΠΙΝΑΚΑΣ ΠΕΡΙΕΧΟΜΕΝΩΝ – TABLE OF CONTENTS

ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

RADIOCARBON IN THE ENVIRONMENT III, 6-10/7/2020, GLIWICE, POLAND

Dear Colleagues,

In this situation, related to the COVID-19 pandemic, **it is impossible to organize a REIII conference this year**. Together with the organizers of other conferences (AMS-15, Radiocarbon Conference, ^{14}C and Diet and Radiocarbon and Archeology), we decided that our conference **will be postponed for a year**. The new date of the conference falls on **July 5th to 9th, 2021**.

We are very sorry for the situation, but we think that this is the best possible solution in this situation.

All details about the conference (conference fee, grants etc.) will be posted soon on c14env.polsl.pl.

Sincerely

Conference organizers

Organising committee e-mail: c14env@polsl.pl
Find us on Facebook: https://fb.com/c14env/

*Information about the General Data Protection Regulation due to EU law can be found on the conference website.

ICONS IN THE MAKING, INTERNATIONAL CONFERENCE-WORKSHOP, 25-26 JANUARY 2021, INSTITUT NATIONAL D'HISTOIRE DE L'ART, CALL FOR PAPERS

2, rue Vivienne 75002 Paris (Room Vasari)

This conference-workshop invites art historians, conservators and conservation scientists to collectively analyse how visual effects in icons are created by the accumulation of layers, which, visible or invisible, participate fully in their final appearance. How to bring into dialogue different methods of analysis, historical, stylistic, iconographic and material, in order to understand the emergence of forms and the processes of creation? It is a question of concretely apprehending gestures of creation and re-creation of icons through time, workshop practices, interventions linked to maintenance, repair and, more generally, to the transformation of icons, in order to write their history on the long term, and to make technical art history participate in a history of social and religious practices.

The conference-workshop follows the workshop organized in December 2019 in Athens by Greek institutions (University of the Aegean, ArticonLab-University of West Attica, Directorate of Conservation of Ancient and Modern Monuments-Hellenic Ministry of Culture, Benaki Museum) and INHA, focusing on the Greek and Ethiopian cases. It is designed to broaden the subject to the Mediterranean area and the Slavic world. The themes addressed should make it possible to review current research, applied or fundamental, on the questions of **creation** and **transformation** of icons, for updating or maintenance and, more recently, for conservation-restoration; the **dissemination** of icons as well as possible **transfers** of materials, techniques and models between the various traditions. Eventually, the question of **attribution** to an author, a workshop or a centre can also be addressed. This two-day conference will also be an opportunity to review recent updates of icon collections in France - purchase, conservation-restoration, exhibition.

Visits of icon collections will be organized during these two days in the partner institutions, with specific discussions on some case study.

Proposals for papers should be sent to Sigrid Mirabaud (sigrid.mirabaud@inha.fr) and Claire Bosc-Tiessι (claire.bosc-tiesse@inha.fr) in the form of an abstract of no more than 2000 characters, and should be accompanied by a short one-page CV. Multidisciplinary two-voice communications are strongly encouraged.

Organising committee

Sigrid Mirabaud (INHA)
Claire Bosc-Tiessι (INHA)
Nicolas Varaine (INHA)
Raphaëlle Ziadé (Petit Palais, Musée des Beaux-Arts de la Ville de Paris)
Nicolas Milovanovic (Musée du Louvre)
Irène Lιontakianakou (University of the Agean)

Scientific committee

Sigrid Mirabaud (INHA)
Claire Bosc-Tiessé (INHA)
Irène Leontakianakou (University of the Aegean)
Athina-Georgia Alexopoulou (Articon Lab, University of West Attica)
Raphaλlle Ziadι (Petit Palais, Musée des Beaux-Arts de la Ville de Paris)
Nicolas Milovanovic (Musée du Louvre)

The deadline for proposals is June 20th, 2020.

This conference-workshop will be held at the Institut national d'histoire de l'art in partnership with the Musιe du Louvre, the Petit-Palais - Musée des Beaux-Arts de la Ville de Paris, the University of the Aegean an the Directorate of Conservation of Ancient and Modern Monuments of the Greek Ministry of Culture.

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Institut national d'histoire de l'art
6 rue des Petits-Champs
ou 2 rue Vivienne
75002 Paris
www.inha.fr

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POSTPONEMENT IRUG14 CONFERENCE

Dear IRUG Participants and Supporters,

We would like to provide an update on our planning for the IRUG14 Conference in Amsterdam, originally scheduled for May 2020.

In March, we postponed the IRUG14 Conference and tentatively reset the new date of May 19-21, 2021. At the time, we felt confident that pushing the conference out by a year would get us beyond the COVID19 crises.

However, we are not yet prepared to finalize the May 2021 dates. Until we can be assured that it is safe to travel again and gather as a group, the May 2021 date for IRUG14 will remain tentative.

Therefore, the IRUG Board of Directors and the Cultural Heritage Agency of the Netherlands advises all participants to wait for further notice before booking airline tickets and accommodations for the IRUG14 Conference.

If possible, please keep the May 2021 conference date for IRUG14 open for now.

We understand the inconvenience caused by this uncertainty, and we thank you for your patience. We will continue to update you as soon as the situation unfolds.

Please direct all inquiries and correspondence to IRUG14@cultureelerfgoed.nl.

Sincerely and best wishes for your health and safety.

The IRUG Board of Directors, Cultural Heritage Agency of the Netherlands, and IRUG14 Conference Organizers

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Cultural Heritage Agency of the Netherlands
Smallepad 5 | 3811 MG Amersfoort
Postbus 1600 | 3800 BP Amersfoort
the Netherlands
+31 (0)33 – 421 7 421
info@cultureelerfgoed.nl
www.culturalheritageagency.nl

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INTERNATIONAL SYMPOSIUM ON ARCHAEOMETRY, LISBON, 10TH - 14TH MAY 2021

Dear colleagues,

The ISA2020, which was **due** to run this week, has been **postponed due** to the **COVID-19** (novel **coronavirus**) outbreak.

The effort to slow the spread of COVID-19 has temporarily halted the scientific meetings as countries and states have banned gatherings of all sizes and organizations have put travel on hold. But as disruptive as these measures have been, resulting in countless conventions and meetings having to be cancelled, postponed or moved to online-only, standing committee have decided to hold our event and move it to a later date when the public-health crisis (hopefully) eases.

The decision to postpone the conference has been taken to minimize costs and risks for all involved, in the wake of decision by the World Health Organization to declare COVID-19 a global pandemic, as well as, our country government rules.
The planning of the conference was well underway, with more than 543 registered participants and 72 confirmed oral communications and 490 poster communications scheduled to take place over the course of five days.

The ISA2020 conference scheduled to be held in Lisbon on May 18-22 was set to be one of the biggest events of ISA. Everyone involved - the Lisbon local organizing committee and ISA's Standing Committee, have worked tirelessly to ensure that ISA2020 would be a truly outstanding symposium. It was particularly important for local organizing committee that the event was to be held in Lisbon, Portugal, for the first time of ISA events.

In addition to all the work of the organizers, planners and designers, there was also the work of all the participants: the panel organizers, the paper contributors, the convenors, and special events organizers. It has been an enormous undertaking. Yet as the tragedy of the Covid-19 emergency unfolded, the likelihood of being able to hold this conference as planned became smaller with every passing day.

As a result, the Conference was postponed to Spring 2021 and we are now pleased to announce the new dates as 10 to 14 May 2021 in Lisbon Portugal!

We sincerely apologize for any inconvenience this will cause for you. We trust that you understand that we made this decision in the best interests of all of you. We wish to assure you that your agreements, registration and participation are unchanged and valid for the new dates. We look very much forward to welcoming you at ISA 2020 in May 2021.

The conference organizers invite all participants to continue their engagement with this

event and will work towards ensuring the programme with an even greater level of participation in May 2021.

All abstracts previously submitted will continue to be valid for the symposium, unless participants wish to make any changes. New submissions will be possible and will be considered according to the slots available. The registrations and payments already made will be maintained.

By the end of this year a new date for early registration will be announced.

Looking forward to welcoming you all in good health in Lisbon May 2021 for ISA2020

M. Isabel Dias, *Chair of the Organization*

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ISA2020 CONTACT
isa2020@isa2020-lisboa.pt
Tel: (+351) 21 994 6183

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NOTICE CONCERNING AMS-15 AND RADIOCARBON CONFERENCES

From the organizers of AMS-15 (Sydney):
With the continuing uncertainty in global affairs because of COVID-19, we have unfortunately decided that the best option in order to ensure a successful AMS-15 conference is to postpone AMS-15 to 2021. We have managed to secure the same venue, UNSW Scientia, for the period Sunday 29 August to Friday 3 September 2021, effectively a calendar year shift.

In addition, discussions were held with Drs Elisabetta Boaretto and Lior Regev, conveners of the 24th International Radiocarbon Conference, which was to be held in March 2021, with Dr Andrzej Rakowski, convener of the 3rd Radiocarbon and Environment conference, which was to be held 6-10 July 2020, and with Prof Tom Higham, convener of the Radiocarbon and Diet conference, which was to be held 14-17 September 2020.

The unanimous decision for these 3 events is to shift them a full calendar year and further announcements will be made in due course for each event.

Discussions with Zurich are still on-going concerning the 10th Radiocarbon and Archaeology Conference, but we expect it will either be combined with another meeting, or held in 2023. Please monitor the Radiocarbon website or the meeting website for updates.

To summarise, in chronological order:

- *3rd Radiocarbon and Environment conference*, (Gliwice, Poland): 5-9 July 2021.
- *AMS-15* (Sydney, Australia): 29 August to 3 September 2021.
- *3rd Radiocarbon and Diet conference* (Oxford, UK): 13-16 September 2021.
- *24th International Radiocarbon conference* (Israel): March 2022 (or to the second half of 2022). Further details will be announced on the Radiocarbon-24 website and via email.

10th Radiocarbon and Archaeology conference (Zurich, Switzerland): (further details to be announced)

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ – JOB VACANCIES/FELLOWSHIPS

PROFESSORSHIP ARCHAEOMETRY, UNIVERSITY OF TÜBINGEN

W 3 Professor of Archaeometry to commence immediately.

The successful candidate will conduct research and teaching spanning the field of Archaeometry. He/ she will be expected to carry out outstanding, internationally visible research activities as well as taking on co-responsibility for a new interfaculty center of Archaeometry, which is currently in development, along with partners both within the University and outside it, such as the Curt-Engelhorn-Zentrum Archäometrie gGmbH. The holder of this position must be expressly willing and able to carry out close interdisciplinary collaboration with the diverse archaeological subjects at the University.

Required qualifications include a PhD or equivalent international degree and postdoctoral qualifications equivalent to the requirements for tenure. This includes evidence of teaching effectiveness. Furthermore, the holder of this position must have international experience and experience in successfully applying for and executing national and international third¬party-funded projects.

The University of Tübingen is particularly interested in increasing the number of women in research and teaching and therefore strongly encourages female candidates to apply. In line with its internationalization agenda, the university welcomes applications from researchers outside Germany. Applications from equally qualified candidates with disabilities will be given preference.

Send your application together with the required documents (curriculum vitae and outline of academic career, scanned copies of certificates and degrees, publications list, list of teaching experience) along with up to 5 publications in electronic form to the Dean of the Faculty of the Humanities (bewerbungen@philosophie.uni-tuebingen.de) by 07.06.2020. Enquiries may also be sent to this address.

HISTORY DECODED!

The Format!

In History Decoded a team of experts use cutting-edge forensic science and state-of-the-art CGI to solve or debunk the world's most enduring and inexplicable mysteries. Each episode centres on five fascinating cases, selected from the recent past right to ancient history. Many stories are globally famous, others are little known or obscure.

We investigate each story using state-of-the-art science and our own amazing Digital Forensics: stunning VFX and CGI that reconstructs each scrap of evidence in staggering detail and places it in its proper context. We use revealing archive to bring each story back to life. We feature first hand interviews with forensic investigators and experts who analyse and decode the clues.

History Decoded mixes state-of the-art forensic science and astonishing CGI with powerful, first hand stories to give viewers a front row seat to the world's most puzzling mysteries as we decode them step by step.

Shoot Details

– We need approximately 15-20 experts for this series.
– We are looking for Forensic Archaeologists, Forensic Anthropologists, Historians & Archaeologists, but would consider other specialities.
– This casting is open to all levels of expertise and these types of shows are a great way to gain experience in front of camera.
– We will be filming in both the UK & US in the weeks starting June 22nd & 29th.
– The interviews will be sit down, studio based and the location will be under Covid-19 government / PACT/ 1st Option filming guidelines.

How to Apply!

If this sounds like something you would be interested in, then please get in touch with us at casting@pastpreservers.com with your availability for the shoot dates & your current location.

If you wish to update your details or are not already registered with us, you can now do this online at https://forms.gle/f3sbAcvBccnx9dAE6

Please visit the site: https://pastpreservers.com/history-decoded/

PHD POSITION LEAD IN MONUMENTAL CONSTRUCTIONS, UNIVERSITY PARIS 8

Dear colleagues,

A PhD position is available at the University Paris 8 (co-supervision with Toulouse), on "Lead in monumental constructions: uses, practices, supply (12th-19th centuries)" funded by the CNRS within the framework of the Notre-Dame scientific project.

This PhD offer is published on the CNRS portal where all the details about the application and the documents to be provided can be found: https://emploi.cnrs.fr/Offres/Doctorant/UMR7041-MAXLHE-002/Default.aspx?lang=EN

The thesis will start on November 1st, 2020.

We thank you for the diffusion of this announcement in your respective networks, in particular to students who might be interested in this offer. They can contact us by email, attaching a CV. Our contacts are available on the CNRS website.

Maxime L'Héritier
Catherine Verna
Sandrine Baron

PHD ANNOUNCEMENT ON IRON METALLURGY/IRON AGE ARCHAEOLOGY IN SOUTHWESTERN AFRICA RESP. NAMIBIA

Dear all,

I am happy to inform you that my PhD on iron metallurgy/Iron Age Archaeology in southwestern Africa resp. Namibia is now available online at https://kups.ub.uni-koeln.de/10885/

The Phd was written at the University of Cologne, Department of African Archaeology.

Best regards

Eileen Kose

FUNDED PHD IN ARCHAEOMETALLURGY AT CAMBRIDGE UNIVERSITY AND BRITISH MUSEUM

Dear all,

Please circulate to colleagues and potentially interested students.

Many thanks, and my wishes of health to all,

Marcos

The University of Cambridge and the British Museum are pleased to announce the availability of a fully funded collaborative doctoral studentship from October 2020 under the AHRC's Collaborative Doctoral Partnership Scheme.

The project "**Brass vs bronze: continuity and change from Late Antiquity to the early Islamic period in the Persian Gulf and adjacent regions"** will provide an excellent opportunity to combine research and training across two world-leading institutions.

The project will be jointly supervised by Professor Marcos Martinón-Torres and Dr Aude Mongiatti, with additional input from relevant curatorial staff such as Dr St John Simpson and others. The student will be expected to spend time at both the University of Cambridge and the British Museum, and be an active member of both academic and research communities, as well as becoming part of the wider cohort of CDP funded students across the UK.

Further details: **https://www.arch.cam.ac.uk/news/new-doctoral-studentship-sasanian-early-islamic-archaeometallurgy**

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Marcos Martinón-Torres
Pitt-Rivers Professor of Archaeological Science
Department of Archaeology
University of Cambridge
Downing Street
Cambridge CB2 3ER
United Kingdom

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CALL FOR LETTERS OF INTEREST: EXECUTIVE DIRECTOR, A. E. LALONDE ACCELERATOR MASS SPECTROMETRY FACILITY, OTTAWA, CANADA

The Board of Directors of the A. E. Lalonde Accelerator Mass Spectrometry Facility (AEL-AMS) is seeking letters of interest from qualified individuals who wish to become the Executive Director sometime in 2021. At that time, the present Director, Dr. Liam Kieser, will be fully devoting his time to the commissioning of the new MICADAS instrument and to innovations associated with the existing 3 MV AMS system. We are seeking an individual with a background in AMS investigations, who can expand the outreach of Lalonde to Canadian science and industry and develop new areas of AMS application. AEL-AMS is one of 17 national research facilities in Canada and is located on the campus of the University of Ottawa, Ottawa, Canada.

More specifically, the successful candidate will coordinate the operations and direct the outreach of the AEL-AMS lab and ensure the AEL-AMS payroll is met. He or she will identify future research areas at this national research facility for Canadian science and ensure its long-term financial stability. He or she will be responsible for coordinating the development and implementation of a strategic plan to ensure that it acquires and sustains an international reputation for scientific excellence in radioisotope analysis. The Director will oversee AMS operations and is expected to maintain AEL-AMS' relationship with the Canada Foundation for Innovation regarding the requirements and opportunities for the Major Science Initiatives programme funding the operations of the two accelerator mass spectrometers at the facility. The Executive Director will engage with Canadian industry, universities and governments on the potential benefits of collaboration with the AEL-AMS in science and technology development and promote the facility within the international AMS community.

The successful candidate will have a publication and achievement record that would on its own merit a full professorship in an academic department of the University of Ottawa. The salary range will be commensurate with experience and demonstrated expertise. The position will be a 5-year contract reporting to the Board of Directors. He or she will have a PhD, preferably in physics. Interested applicants should submit letters of interest with their curriculum vitae to Dr. Marie D'Iorio of the Board of Directors at mdiorio@uottawa.ca by July 1st.

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

MSC IN CULTURAL HERITAGE MATERIALS & TECHNOLOGIES (CULTTECH), DEPARTMENT OF HISTORY, ARCHAEOLOGY & CULTURAL RESOURCES MANAGEMENT, SCHOOL OF HUMANITIES & CULTURAL STUDIES, UNIVERSITY OF PELOPONNESE

Applications online until August 15th 2020.

Subjects:
- Cultural Landscapes and Materials
- Archaeometry I. Approaches for Archaeology and Cultural Heritage
- Archaeometry II. Non-Destructive and Innovative Methodologies for Cultural Heritage
- Laboratory Practices: Use of Laboratory and Portable Instrumentation. Stereo Microscope, FOM, Petrography Microscopy, RAMAN, SEM, XRF
- Cultural Heritage Management and Information Communication Technologies for Cultural Heritage
- Environmental and Remote Studies for Cultural Heritage
- Field Prospection and Computing Technologies for Cultural Heritage
- Computing Practices: GIS, Statistical Analysis and Computing Aided Applications

****

Evangelia Kyriazi, MSc
Conservator of Stone, Fossils, Antiquities & Works of Art,
PhD Researcher, University of Peloponnese

orcid.org/0000-0003-3358-1756
pedis.academia.edu/EvangeliaKyriazi
www.linkedin.com/pub/evangelia-kyriazi
https://www.researchgate.net/profile/Evangelia_Kyriazi/

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Please visit the site: http://ham.uop.gr/en/msci-culttech

INTERNET SITES

TAKE A VIRTUAL TOUR OF TWO RECENTLY EXCAVATED HOMES IN POMPEII - POMPEII ARCHAEOLOGICAL PARK DIRECTOR MASSIMO OSANNA NARRATES STUNNING DRONE FOOTAGE OF PRESERVED DAILY LIFE IN THE ANCIENT CITY, BY NORA MCGREEVY

For the last two years, ongoing excavations in Pompeii's Regio V have unearthed extraordinary examples of daily life in the ancient Roman city. In one middle-class home, archaeologists discovered traces of a millennia-old garden; on the floor of another residence, they discovered a remarkably intact mosaic of the hunter Orion turning into a constellation—likely a reference to an obscure myth, as Franz Lidz reported for Smithsonian magazine last September.

Now, thanks to a short but stunning video tour released Tuesday by the Italian Ministry of Cultural Heritage and Activities, audiences can enjoy a bird's-eye view (or rather a drone's-eye view) of these new excavations from the comfort of home, reports HeritageDaily.

In the video, Pompeii Archaeological Park Director Massimo Osanna narrates a tour of two Pompeiian homes that were entombed in ash alongside the rest of the city when Mount Vesuvius erupted in 79 A.D.

The director's Italian remarks are translated into English in a statement and can also be read using YouTube's auto-translate feature, according to HeritageDaily.

Osanna takes viewers inside two domus dwellings, or private residences, on either side of Vicolo dei Balconi, or Alley of the Balconies. In the first home, dubbed the House With the Garden, researchers were able to make casts of the roots of plants that grew in the family's garden. The team also found macabre evidence of Mount Vesuvius' toll: the remains of 11 people, mostly women and children, who were likely taking shelter from the fatal blast during their final moments.

Just across the street is the House of Orion, which derives its name from colorful floor mosaics that depict Orion, suspended over a coiled cobra, turning into a constellation. The snake's appearance may reference a Greek myth with ancient Egyptian influences, Osanna speculates during the tour.

"The owner of the house must have been greatly attracted to this myth, considering it features in two different rooms in which two different scenes of the myth are depicted," the director continues. "It is a small house which has proved to be an extraordinary treasure chest of art."

A sorceress' kit unearthed in Pompeii last year (Pompeii Archaeological Park)

Regio V, a 54-acre area north of the archaeological park, is currently being excavated as part of the Great Pompeii Project, a $140 million conservation project underwritten in large part by the European Union.

Already, the project has yielded a number of exciting finds, including a richly painted thermopolium, or "fast food" stand, where Pompeiians would have snacked on spiced wine; cheeses; and garum, a potent sauce made from fish insides, reported Angela Giuffrida for the Guardian in March 2019. Other fascinating finds include a sorceress' kit, a bloody gladiator fresco and a still-saddled horse.

"These excavations have yielded an extraordinary cross-section of … daily life of this city," says Osanna in the video.

As Smithsonian magazine reported last year, the discovery of a specific set of graffiti in Regio V yielded crucial new insight on the city's history. Based on the date listed in the graffiti—the 16th day before the first of November on the ancient calendar, or October 17 on the modern one—archaeologists now suspect that Vesuvius erupted in the fall, not in August as previously believed.

"This spectacular find finally allows us to date, with confidence, the disaster," Osanna told Smithsonian. "… When you reconstruct the daily life of this vanished community, two months of difference are important. We now have the lost piece of a jigsaw puzzle."

Please visit the site: https://www.smithsonianmag.com/smart-news/take-virtual-tour-these-newly-excavated-pompeiian-homes-180974654/ [Go there for linx]

POMPEII AND HERCULANEUM (90')

In 2013 we broadcast live from our blockbuster exhibition Life and Death in Pompeii and Herculaneum. This 90 minute broadcast presented by Bettany Hughes and Peter Snow includes interviews with Rachel De Thame, Giorgio Locatelli and Mary Beard. Please be advised this recording is BBFC rated as 12A and contains some sexual imagery and swearing, viewer discretion is advised. Life and death in Pompeii and Herculaneum was sponsored by Goldman Sachs. The exhibition was a collaboration with Soprintendenza Speciale per i Beni Archeologici di Napoli e Pompei.

Please visit the site: https://www.youtube.com/watch?v=0Cinu9yIbp0

NEW HISTORICAL METALLURGY WEBSITE

I can proudly announce the launch of the **New Historical Metallurgy Website!**

The site has moved to a new host and has been revitalised with a new layout and design. The new, improved website has more capabilities than the old site and will now work on a variety of devices including mobile phones. There are a bunch of new features, including links to our online databases, including the Tylecote and National Slag Collections, among others.

Everything you know and love from the old website is there, next to some new content that will be added to over the next few months and years. Other aspects of the site including the newsletters, past events and journal shop pages have been improved to make things easier to find

To celebrate the launch the HMS shop is having a SALE! All journal volumes and occasional publications are 10% off until the 16th of May.

So please visit historicalmetallurgy.org to view the new site.

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

WHY THE SCIENCES OF THE ANCIENT WORLD MATTER

Series Editors: Chemla, Karine, Keller, Agathe, Proust, Christine
ISSN: 2662-9933

This book series thus intends to publish books that contribute to building bridges between the history of sciences in the ancient worlds and other fields, and highlight how ancient sciences offer resources to raise new questions, and develop new methods in other domains. Such new methods invite critical reflection not only on past historical research, which the book series also intends to promote, but also vis-à-vis present-day uses of ancient science in various forums.

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Volumes available: https://www.springer.com/series/15657?detailsPage=titles [Go there for details. format and ordering]

Mathematics, Administrative and Economic Activities in Ancient Worlds
Series: Why the Sciences of the Ancient World Matter, Vol. 5 Michel, Cécile, Chemla, Karine (Eds.), 2020
Price from 114,39 €

The Making of a Scribe Errors, Mistakes and Rounding Numbers in the Old Babylonian Kingdom of Larsa
Series: Why the Sciences of the Ancient World Matter, Vol. 4 Middeke-Conlin, Robert, 2020
Price from 74,89 €

Monographs in Tang Official Historiography Perspectives from the Technical Treatises of the History of Sui (Sui shu)
Series: Why the Sciences of the Ancient World Matter, Vol. 3 Morgan, Daniel Patrick, Chaussende, Damien (Eds.), 2019
Price from 85,59 €

Scholars and Scholarship in Late Babylonian Uruk
Series: Why the Sciences of the Ancient World Matter, Vol. 2 Proust, Christine, Steele, John (Eds.), 2019
Price from 58,84 € Your Discounted Price valid through July 31, 2020

Pieces and Parts in Scientific Texts
Series: Why the Sciences of the Ancient World Matter, Vol. 1 Bretelle-Establet, Florence, Schmitt, Stéphane (Eds.), 2018
Price from 85,59 €

Other titles are in preparation.

Should you wish to submit us a manuscript for this collection, please contact Christine Proust (christine.proust@orange.fr)

Please visit the site:
https://www.springer.com/series/15657https://www.springer.com/series/15657

TRACKING THE NEAR EASTERN ORIGINS AND EUROPEAN DISPERSAL OF THE WESTERN HOUSE MOUSE

Thomas Cucchi[1], Katerina Papayianni[1,2], Sophie Cersoy[3], Laetitia Aznar-Cormano[4], Antoine Zazzo[1], Régis Debruyne[5], Rémi Berthon[1], Adrian Bălășescu[6], Alan Simmons[7], François Valla[8], Yannis Hamilakis[9], Fanis Mavridis[10], Marjan Mashkour[1], Jamshid Darvish[11,24], Roohollah Siahsarvi[11], Fereidoun Biglari[12], Cameron A. Petrie[13], Lloyd Weeks[14], Alireza Sardari[15], Sepideh Maziar[16], Christiane Denys[17], David Orton[18], Emma Jenkins[19], Melinda Zeder[20], Jeremy B. Searle[21], Greger Larson[22], François Bonhomme[23], Jean-Christophe Auffray[23] & Jean-Denis Vigne[1]

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[3]Centre de Recherche sur la Conservation (CRC), Muséum national d'Histoire naturelle, CNRS, Ministère de la Culture, CP 21, 36 rue Geoffroy Saint-Hilaire, 75005, Paris, France.
[4]Centre de recherche en Paléontologie Paris, UMR7207, Muséum national d'Histoire naturelle, CNRS, Sorbonne Université, 8 rue Buffon, 75005, Paris, France.
[5]DGD-REVE, Muséum national d'Histoire naturelle, 17 Place du Trocadéro, bureau E205, 75016, Paris, France.
[6]Vasile Pârvan, Institute of Archaeology, Romanian Academy, 11 Henri Coandă Street, Bucarest, Romania.
[7]Department of Anthropology, University of Nevada, Las Vegas/Desert Research Institute, Reno, Nevada, USA.
[8]Archéologies et Sciences de l'Antiquité (Arscan), UMR 7041 CNRS, Université de Paris Nanterre, Paris I, 92023, Nanterre, France.
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Abstract

The house mouse (*Mus musculus*) represents the extreme of globalization of invasive mammals. However, the timing and basis of its origin and early phases of dispersal remain poorly documented. To track its synanthropisation and subsequent invasive spread during the develoment of complex human societies, we analyzed 829 *Mus* specimens from 43 archaeological contexts in Southwestern Asia and Southeastern Europe, between 40,000 and 3,000 cal. BP, combining geometric morphometrics numerical taxonomy, ancient mitochondrial DNA and direct radiocarbon dating. We found that large late hunter-gatherer sedentary settlements in the Levant, c. 14,500 cal. BP, promoted the commensal behaviour of the house mouse, which probably led the commensal pathway to cat domestication. House mouse invasive spread was then fostered through the emergence of agriculture throughout the Near East 12,000 years ago. Stowaway transport of house mice to Cyprus can be inferred as early as 10,800 years ago. However, the house mouse invasion of Europe did not happen until the development of proto urbanism and exchange networks — 6,500 years ago in Eastern Europe and 4000 years ago in Southern Europe — which in turn may have driven the first human mediated dispersal of cats in Europe.

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Please visit the site: https://www.nature.com/articles/s41598-020-64939-9

RECENT DEVELOPMENTS IN CALIBRATION FOR ARCHAEOLOGICAL AND ENVIRONMENTAL SAMPLES

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Abstract

The curves recommended for calibrating radiocarbon (14C) dates into absolute dates have been updated. For calibrating atmospheric samples from the Northern Hemisphere, the new curve is called IntCal20. This is accompanied by associated curves SHCal20 for the Southern Hemisphere, and Marine20 for marine samples. In this "companion article" we discuss advances and developments that have led to improvements in the updated curves and highlight some issues of relevance for the general readership. In particular the dendrochronological based part of the curve has seen a significant increase in data, with single-year resolution for certain time ranges, extending back to 13,910 calBP. Beyond the tree rings, the new curve is based upon an updated combination of marine corals, speleothems, macrofossils, and varved sediments and now reaches back to 55,000 calBP. Alongside these data advances, we have developed a new, bespoke statistical curve construction methodology to allow better incorporation of the diverse constituent records and produce a more robust curve with uncertainties. Combined, these data and methodological advances offer the potential for significant new insight into our past. We discuss some implications for the user, such as the dating of the Santorini eruption and also some consequences of the new curve for Paleolithic archaeology.

Radiocarbon, 1-23. doi:10.1017/RDC.2020.22

Please visit the site:
https://www.cambridge.org/core/journals/radiocarbon/article/recent-developments-in-calibration-for-archaeological-and-environmental-samples/671DCC8A4A38ACF57786EFC659E5D8F6

RADIOCARBON DATING THE GREEK PROTOGEOMETRIC AND GEOMETRIC PERIODS: THE EVIDENCE OF SINDOS

Stefanos Gimatzidis, Bernhard Weninger

https://doi.org/10.1371/journal.pone.0232906

Abstract

Mediterranean Early Iron Age chronology was mainly constructed by means of Greek Protogeometric and Geometric ceramic wares, which are widely used for chronological correlations with the Aegean. However, Greek Early Iron Age chronology that is exclusively based on historical evidence in the eastern Mediterranean as well as in the contexts of Greek colonisation in Sicily has not yet been tested by extended series of radiocarbon dates from well-dated stratified contexts in the Aegean. Due to the high chronological resolution that is only achievable by (metric-scale) stratigraphic 14C-age-depth modelling, the analysis of 21 14C-AMS dates on stratified animal bones from Sindos (northern Greece) shows results that immediately challenge the conventional Greek chronology. Based on pottery-style comparisons with other sites, the new dates for Sindos not only indicate a generally higher Aegean Early Iron Age chronology, but also imply the need for a revised understanding of the Greek periodisation system that will foreseeably have a major impact on our understanding of Greek and Mediterranean history.

Please visit the site:
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232906 [Go there for full download]

FINGERPRINT EVIDENCE FOR THE DIVISION OF LABOUR AND LEARNING POTTERY-MAKING AT EARLY BRONZE AGE TELL EṢ-ṢÂFI/GATH, ISRAEL

Kent D. Fowler, Jon Ross, Elizabeth Walker, Christian Barritt-Cleary, Haskel J. Greenfield, Aren M. Maeir

Abstract

The organization of craft production has long been a marker for broader social, economic and political changes that accompanied urbanism. The identity of producers who comprised production groups, communities, or workshops is out of reach using conventional archaeological data. There has been some success using epidermal prints on artefacts to identify the age and sex of producers. However, forensic research indicates that a combination of ridge breadth and ridge density would best identify the age and sex of individuals. To this end, we combine mean ridge breadth (MRB) and mean ridge density (MRD) to distinguish the age and sex of 112 fingerprints on Early Bronze Age (EB) III pottery from the early urban neighbourhood at Tell eṣ-Ṣâfi/Gath, Israel, dating to a 100 year time span.

Our analysis accounts for the shrinkage of calcareous fabrics used to make six type of vessels, applies a modified version of the Kamp et al. regression equation to the MRB for each individual print, and infers sex by correlating MRD data to appropriate modern reference populations. When the results are combined, our analyses indicate that most fingerprints were made by adult and young males and the remainder by adult and young females. Children's prints are in evidence but only occur on handles. Multiple prints of different age and sex on the same vessels suggest they were impressed during the training of young potters. Production appears dominated by adult and young males working alone, together, and in cooperation with adult and/or young females.

Vessels with prints exclusively by females of any age are rare. This male dominant cooperative labour pattern contrasts recent studies showing that adult women primarily made Neolithic figurines in Anatolia, and more females than males were making pottery prior to the rise of city-states in northern Mesopotamia.

Please visit the site:
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0231046

ΕΙΔΗΣΕΙΣ - NEWS RELEASE

SCIENTIST BAKES SOURDOUGH BREAD WITH 4,500-YEAR-OLD YEAST FOUND IN EGYPTIAN POTTERY, BY CAITLIN O'KANE

Cooking is arguably both an art and a science — and if you're a physicist with some 4,500-year-old yeast in your cupboard, then it's a history lesson, too. Seamus Blackley, a scientist and video game designer, recently baked loaf of bread using some ancient yeast found in Egyptian pottery, and his culinary journey has gone viral.

Blackley worked with Egyptologist Dr. Serena Love and microbiologist Richard Bowman to obtain dormant yeast samples from the Peabody Museum of Archaeology & Ethnology at Harvard.

The yeast was cultivated from the pores of ancient ceramic pots that were once used for beer and bread making, Blackley explained on Twitter. Over a year, Blackley and his colleagues collected samples from these pots and studied the microorganisms within them.

Two weeks ago, with the help of Egyptologist @drserenalove and Microbiologist @rbowman1234, I went to Boston’s MFA and @Harvard’s @peabodymuseum to attempt collecting 4,500 year old yeast from Ancient Egyptian pottery. Today, I baked with some of it...

Blackley sterilized his contraband then fed and cultivated it into a yeast that was good enough to bake with. He combined the yeast with ancient, organic grains, added some water and unfiltered olive oil, and created an ancient sourdough in the 21st century.

"The idea is to make a dough with identical ingredients to what the yeast ate 4,500 years ago. The aroma of this yeast is unlike anything I've experienced," Blackley wrote on Twitter.

He photographed each step of the baking process, and although he had to go through a few extra steps to sterilized and cultivate the ancient yeast, he did end up with a normal-looking dough. "This crazy ancient dough fermented and rose beautifully," he wrote, sharing a photo of the unbaked dough.

Blackley baked the dough with a special touch: he scored the hieroglyph for "loaf of bread" on top, paying homage to the bread's Egyptian roots.

"The aroma is AMAZING and NEW," Blackley wrote. "It's much sweeter and more rich than the sourdough we are used to. It's a big difference.
After this cools we will taste!"

Then came the big moment — what did this dough, made with ancient yeast, taste like? "The crumb is light and airy, especially for a 100% ancient grain loaf. The aroma and

flavor are incredible. I'm emotional," Blackley wrote in his stellar review of the creation. Of course, he may have been a little biased: he was the man behind the culinary marvel.

"It's really different, and you can easily tell even if you're not a bread nerd," Blackley wrote. "This is incredibly exciting, and I'm so amazed that it worked."

Please visit the site: https://www.cbsnews.com/news/scientist-bakes-sourdough-bread-with-4500-year-old-yeast-found-in-egyptian-pottery/

AUTHORITIES TO LAUNCH ARCHAEOLOGICAL EXCAVATIONS NEAR PETRA'S TREASURY

The rose-red city of Petra will witness archaeological excavations to unearth the front courtyard of the Treasury, Petra's iconic façade.

The Petra Development and Tourism Region Authority (PDTRA) on Sunday announced the launch of archaeological excavations, which will be funded by the authority in cooperation with the Department of Antiquities, PDTRA's Chief Commissioner Suleiman Farajat said in a PDTRA statement.

An academic archaeological team from Hussein Bin Talal University will also take part in the project, Farajat said.

The excavation will contribute in uncovering the architectural elements of the lower part of the Treasury, as well as complete the archaeological work of 2003 that uncovered some of the tombs and facades below the Treasury, he said, adding that excavation is expected to stretch from the Treasury yard to the end of the Siq towards the Nabatean Amphitheatre.

This joint project aims at identifying the actual use of the archaeological structures near to the Treasury and uncovering the rest of the water system and channels that the ancient city relied on in the past for draining rain water, according to the statement.

It also aims to help explain the reasons for the construction of the Treasury's façade, as there are multiple theories about its history, the statement said.

Farajat added that the project will further attempt to clear flood debris accumulated during recent years, which cover part of the corridor and the area close to the Treasury.

Excavations will be accompanied by an action plan designated to rearrange the site's provided services, guidance signs and public facilities in accordance with the project's findings.

Last year, PDTRA carried out a geophysical survey of the site, which will be used to identify the excavation locations in the archaeological reserve, the statement added.

Please visit the site: https://menafn.com/1100144790/Authorities-to-launch-archaeological-excavations-near-Petras-Treasury

A PERFECT STORM: HOW EARLY CHRISTIAN FARMING IN THE NEGEV COLLAPSED

Israeli archaeologists date the remnants of flourishing agriculture in the desert and discover exactly when, and possibly why, it came to a bitter end Ruth Schuster

The Negev Desert isn't the first place that comes to mind when one thinks about agricultural abundance, yet beginning over 2,000 years ago and up to about 1,500 years ago very roughly, slightly less inhospitable parts of the desert were intensively farmed. From early Roman times, villagers in the Negev worked the bitter land.

By the early Byzantine era, which began in 324 C.E., the farmers were flourishing by dint of remarkable water management and by strategically locating towering dovecotes in agricultural fields. The people grew olives, grapes and subsistence crops in the nutrient-poor loess soil, literally fertilized by the birds' copious emissions.

And then they were gone. What happened to the ancient dryland farmers of the Negev and when it happened – before or after the advent of the early Islamic period – has been a mystery. Some have thought agriculture disappeared in the late Byzantine period, which ended in 638 C.E., while others thought it persisted well into the Islamic period, to the 10th or 11th century.

Now Israeli archaeologists Yotam Tepper, Naomi Porat and Guy Bar-Oz of the University of Haifa believe they have cracked the puzzle, based on thorough dating of the entire agricultural system at one representative spot, the ancient village of Shivta.

Unfavorable circumstances combined to tip the balance against the ancient agriculturalists of Shivta and the Negev, they concluded. In the aftermath of this sort of perfect storm, some villages such as Nessana (aka Nitzana) hung on longer than others – well into the Islamic period. But ultimately all succumbed and the desert reverted to barren wasteland peopled by the odd nomadic group.

In the case of Shivta, the team concludes that agriculture began in the Roman period, in the 1st or 2nd century C.E., and that its collapse coincided with the end of the Byzantine rule and start of the Islamic period, as Tepper, Porat and Bar-Oz report in the Journal of Arid Environments. The abrupt political transformation was part of the problem, but far from the whole story.

Please visit the site: https://www.haaretz.com/archaeology/.premium-a-perfect-storm-how-early-christian-farming-in-the-negev-collapsed-1.8836984 [Go there for pix]

PARTICLE ACCELERATOR TO HELP READ DEAD SEA SCROLLS TOO FRAGILE TO UNROLL, BY ARIEL DAVID

Researchers are on the cusp of perfecting a technique to read Dead Sea scrolls that are too brittle to be unrolled and decipher the content of these 2,000-year-old texts without ever opening them.

An international team of archaeologists, computer scientists and physicists is planning to virtually unwrap these fragile manuscripts by tapping into the power of a synchrotron, a massive ring-shaped particle accelerator in which scientists smash atoms together to figure out how the Universe works.

Scholars have been able to decipher most of the parchments and papyri found along the shores of the Dead Sea, but a few dozen are in such poor condition that any attempt to unroll them would almost certainly destroy them, explains Pnina Shor, curator for the Dead Sea Scrolls at the Israel Antiquities Authority.

Unintuitively, given their discovery in one of the more arid spots on Earth, most of these scrolls have been damaged by humidity, which caused what experts call a process of gelatinization, Shor explains.
That turns the scrolls of papyrus or parchment into a single lump, and experience teaches that trying to open and tease apart the layers simply ruins them, she says.

These blackened lumps of organic material don't look like much, but biblical scholars are still eager to read them, hoping to either discover new texts or in order to compare known verses of scripture to their current form. Considered the oldest copies of the Hebrew Bible, the Dead Sea scrolls were penned before the canonization of the Jewish holy books, meaning they sometimes differ from the traditional version as we know it today or include apocryphal texts.

Reading the oldest Torah

The project builds on the team's recent success in deciphering the charred remains of the Ein Gedi scroll, a parchment unearthed in the ruins of the synagogue of the ancient settlement that gives it its name. The scroll, written in the third or fourth century C.E., had been reduced to a chunk of charcoal when the synagogue of Ein Gedi burned down in around the year 600.

In 2015, the team used micro-CT scanning and advanced imaging algorithms to digitally separate the layers within the scroll. They then virtually unwrapped the manuscript and could actually read the text – which turned out to be the first two chapters of Leviticus, making it the most ancient Torah scroll found since the Dead Sea scrolls and the most ancient ever found in a synagogue.

"The scroll from Ein Gedi was really a breakthrough," says Brent Seales, a professor of computer science at the University of Kentucky who developed the software used for the

digital unwrapping. “We did some follow-up work with small fragments that can’t be opened and we realized the technique can be applied to more than that one item.”

The Ein Gedi parchment was found in the same area as the Dead Sea Scrolls but isn’t categorized as part of that “collection,” because it dates to the later Byzantine period. The Dead Sea scrolls generally date from the third century B.C.E. to the first century C.E.

However, the provenance of the Ein Gedi scroll from a later age was helpful to the researchers because by that time ink commonly contained traces of metal, usually lead or iron, which made the ink much denser than the animal skin on which the scribes wrote. That greater density made the letters more visible in the CT scan – in the same way that bone looks much brighter than soft tissues in an X-ray image.

But this is not the case for the actual Dead Sea scrolls, which were written earlier, mostly in carbon ink, made with soot and a binding agent.

Woven textile found at Qumran caves, site of the Dead Sea Scrolls Olivier FitoussiPnina Shor with a relatively legible piece of the Dead Sea Scrolls Alex Levac

Add to this that most Dead Sea scroll fragments are even smaller than the cigar-sized Ein Gedi scroll, requiring even better-quality scans, Seales says.

High-resolution scans done in 2018 on a few gelatinized Dead Sea scrolls showed that it is still possible to make out letters inside these parchments, but an even higher resolution is required to fully decipher the texts, Shor tells Haaretz.

Enter the synchrotron

That’s how the researchers got the idea to stick some of the oldest known copies of the Bible into one of the most complex and advanced machines built by humans.

Particle accelerators are perhaps best known for producing the high-energy collisions that help scientists discover exotic sub-atomic particles, with the aim of gaining a deeper understanding of the laws of physics. But they are also used to generate and study X-rays, generally for their medical applications in diagnostics and cancer treatment.

Those same X-rays can be used to make higher resolution scans of the damaged scrolls than any existing CT machine, says Seales.

“The X-rays produced by the accelerated particles are much finer and more controllable than the ones on a desktop machine. You can get to a resolution that is sub-micron, in the nanometer range,” he says, noting that the imaging capabilities of synchrotrons have already been enlisted, for example, to study the minutest details of fossil insects trapped in amber.

It bears saying that, while transporting delicate antiquities always entails some risk of damage to the artifact, exposing inanimate objects like the Dead Sea scrolls to X-rays does not cause any harm in and of itself.

Damaged remains of a Minor Prophets scroll, still attached to its original stick. Shai Halevi / Israel Antiquities Authority

So, Seales and the rest of the team have been looking to close an agreement with a particle accelerator to conduct their study. Possible candidates include the synchrotron at Brookhaven in New York or the machine operated by Stanford University in California, Seales says.

The coronavirus crisis has slowed the team's plans, but assuming the pandemic recedes and travel restrictions are lifted, they should be ready to conduct their experiments by this fall, he estimates.

The first "test subjects" would be a tiny scroll found rolled up inside a phylactery, as well as two larger parchments of the book of Ezekiel and Minor Prophets (these two could be identified because parts of them have fallen off and could therefore be read), Shor says.

As with most research on the biblical scrolls in the collection, experts will be looking for differences between these manuscripts and the so-called Masoretic text, the authoritative version of the Hebrew Bible codified in the early Middle Ages, Shor says. Even small changes have given experts clues about the history of the biblical text and the different sects into which Judaism was divided at the end of the Second Temple Period.

"This started as a conservation project, but soon I realized it was going to open a new page for the scholarly community," Shor says. "We are advancing scholarship by deciphering these scrolls, but at the same time we are protecting them for a time when, maybe, it will be possible to open them without damaging them."

Can't fake out the particle accelerator

Virtual unwrapping could also be an additional diagnostic tool to help identify forgeries, which are particularly frequent in the gray area of the international trade in Dead Sea scroll fragments. This phenomenon was spectacularly displayed by the recent revelation that all 16 Dead Sea scroll fragments housed at the Museum of the Bible in Washington D.C. were fakes.

"Virtual unwrapping can only help in this regard," Seales says. "These scans see through every level of the parchment, down to the cellular structure of the animal whose skin was used to make it, and you can't fake that."

Of course, it's not easy to book time on a busy particle accelerator to study every single fragment of parchment, but Seales believes that once they have found the best imaging methods a more small-scale system can be built, similarly to what is done with medical equipment used for radiation therapy in hospitals.

"Once we figure out the right settings it's possible to reengineer a system that is portable that can produce those specific X-rays without having the whole apparatus of a particle accelerator," he tells Haaretz.

To be clear, such a technique would not just be useful to decipher Dead Sea scrolls, but could help experts read many other ancient manuscripts that are too fragile to be handled.

In fact, Seales is also heading a separate effort to virtually unwrap the most fragile unopened texts recovered from the so-called Villa of the Papyri in Herculaneum, where nearly 2,000 charred scrolls were found buried by the eruption of Mount Vesuvius that destroyed that town as well as nearby Pompeii in 79 C.E.

One of the papyri was scanned in October at the Diamond particle accelerator in Oxfordshire, and while the results are still being studied, Seales says he is confident they will be able to decipher this text as well.

“Archaeologists are not finding new things all the time, especially in terms of texts,” Seales says, speaking about the importance of unlocking the secrets of these ancient manuscripts. “The Classical Era and the Second Temple Period are largely locked away from us now, so it’s important to get everything out of what we have and understand as much as we can.”

Refining the scans and machine learning techniques that help us virtually peel away wafer-thin layers of ancient scrolls and identify the words penned on them is something that can have applications in many other fields as well, Seales adds.

“For example, mapping out the neuron structure of the brain is a really important problem in understanding pathology and our own anatomy,” he notes. “Tracing single neurons through a high resolution scan is a very similar problem to tracing the layer of a very thin scroll: geometrically the problems are very similar.”

So it might yet happen that deciphering the missing pieces in the Dead Sea scrolls puzzle may lead us to crack another great mystery, that of the innermost workings of the human brain.

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He worked for five years as AP's correspondent in Rome, covering Italy and the Vatican.

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Please visit the site: https://www.haaretz.com/archaeology/.premium.MAGAZINE-particle-accelerator-to-help-read-dead-sea-scrolls-too-fragile-to-unroll-1.8821595
[Go there for pix, caps. and link to video]

THE ANCIENT LANDS OF HONEY: MIDDLE EAST, EGYPT, GREECE, BY SOPHIA GERMANIDOU

It is impossible indeed to imagine life without sweetness, especially since craving sweet sensations is instinctive for humans. Pursuit of sweetness is thus especially ancient.

From the earliest times humans consumed species such as grapes, figs, dates, or carobs. The Old Testament also refers to another exotic and mythical sweetener, manna, a substance that fell from the sky in the form of rain during the cool nights in the desert.

But what about honey? Bees appeared on earth 80 million years ago, and the most productive and manageable species, apis mellifera or mellifica, is only five million years old.

Humans likely gathered honey in the same manner as their primate ancestors, but the first representations of interaction between humans and bees are in cave paintings of Spain, India, and Africa that date to approximately 15,000-10,000 BCE. The paintings show human figures gathering wild honey from nests hanging on trees but not from beehives.

Some of these paintings illustrate smoking the bees' nest, a technique which suppresses the pheromones released by bees guarding the nest and prevents the human from being stung.

After the discovery of this marvelous substance came efforts to "cultivate" it, one of the most significant developments in the agro-pastoral way of life: housing bees inside pots, namely beekeeping. According to iconographic evidence, this important innovation took place in Egypt somewhere around 2,500 BCE.
Representations in tombs of officials show cylindrical, horizontally placed clay pots containing hives, and illustrate the collection and storage of honey.

Ancient Egyptians developed beekeeping as a large-scale production process and expanded the uses of bee products. Honey was not only used in cooking, baking, and beverage making, but in medicine and pharmacology, including treatment of wounds and various illnesses, in mummification, and in beauty and cosmetic products, such as perfumes.
One of the most famous examples is Cleopatra's bath in milk and honey.

Beekeeping then diffused to Mesopotamia, Europe, China, and India. The excavations in northern Israel at Tel Rehov, which date to the mid-tenth century BCE, uncovered the remains of a huge apiary, consisting of at least 180 horizontal, cylindrical beehives made of sun-dried mud.

This discovery provides a tangible link to the Old Testament phrase to the Promised Land flowing with milk and honey (Exodus 3:17).

But honey is also mentioned in other religious texts, such as the Vedas, the Talmud, the New Testament, and the Quran. For example, Hindu gods Vishnu, Krishnu, and Indra were called Madhava, nectar-born ones, and were symbolized by bees. In the Quran, Surah 16 is entitled "The Bees" and commends humans to emulate the industry of bees. Beyond its nutritional value, honey became a spiritual and metaphysical symbol, which affected the collective consciousness of many traditions.

In ancient Greece, the most famous production centre of thyme honey – the finest variety – was Athens. Beehives dating to the mid-sixth century BCE were found in the centre of the city, as well as at its outskirts. Ancient writers even attributed supernatural qualities to Attic honey, believing it could bring long life. Philosophers such as Pythagoras and Democritus – both of whom lived until approximately 90 – claimed that their good health was due to the consumption of honey.

For the first time honey also became the subject of scientific research by the Greek philosopher Aristotle, the first scientific beekeeper, in his compendium Historia Animalium. The physician Hippocrates also established the health benefits of honey, advising the use of vinegar and honey for pain, water and honey for thirst, and a mixture of honey, water, and other substances for fevers.
Hippocrates recommended honey for treatment of many other conditions, including baldness, contraception, wounds, eye diseases, and many more. Both honey and the bees played a central role in ancient Greek myths, as symbols of chastity, rebirth, and fertility.

The Romans dealt with beekeeping extensively, organizing it in terms of taxation and achieving high levels of quality, variety, and efficiency. Bees and the beekeeping practices were thoroughly studied by Roman agricultural writers such as Virgil, Varro, Columella, and Pliny the Elder. The physician Pedanius Dioscorides described the characteristics and qualities of the finest honey as sweet and pungent in taste, with a pleasant smell, yellowish in colour, not liquid but somehow 'sticky' and fine.

Recipes featuring honey are found in the collection De Re Coquinaria, erroneously attributed to Marcus Gavius Apicius (1st c. BCE). These include honey as a substance for the preparation of beverages, as a
meat- and fruit preservative, and as an additive to sauces, usually next to vinegar. Souffles, fruit desserts, pancakes, veal, and tuna dishes all featured honey.

By the end of Classical Antiquity and during the spread of Christianity, honey collection and management were fully organised industries. Mediterranean honey producers sought ways to increase the quantity to be gathered and to improve the honey's quality. In order to attain these goals, simple but effective practices were applied, such as nomadic beekeeping, in which beekeepers moves hives from place to place to follow the various seasonal plants in bloom.

Another method to improve quality were technical innovations, probably applied for the first time by the beekeepers in ancient Attica, namely vertical rather than horizontal beehives, and circular extension rings adjusted the mouth of horizontal hives.

Plan of ancient Greek beehives with extension rings attached to their mouth.
Their use was connected to the collection of a famous honey-type, the so-called akapniston (unsmoked) honey, which was harvested without the use of smoke in order to

maintain its taste and smell. Due to this difficult and demanding beekeeping practice, unsmoked honey was rarely consumed by most of the population.

After the establishment of Christianity, honey was used in multiple ways and it became charged with various theological and metaphysical notions. John the Baptist, for example, survived in the wilderness on a diet of locusts and wild honey, while Jesus ate a honeycomb and fish after his resurrection.

Beekeeping continued to develop, especially in Byzantium and the medieval West, until the discovery of sugar and its final 'dominance' as a main sweetener. But this remarkable substance remains part of our diet today and a symbol of the vitality and fragility of nature.

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Sophia Germanidou is an archaeologist on the staff of the Ephorate of Antiquities of Messenia, Greece.

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Please visit the site: http://www.asor.org/anetoday/2020/05/ancient-lands-honey [Go there for pix and nicer format]

THE ELITES WERE LIVING HIGH. THEN CAME THE FALL - MODERN CITIES CAN LEARN FROM THE FATE OF THE COLLAPSED CIVILIZATIONS AT UGARIT AND MYCENAE, BY ANNALEE NEWITZ

About 3,190 years ago, a merchant in Emar, a trading outpost in what is now northern Syria, sent a desperate letter to his boss, Urtenu, who lived in the rich metropolis of Ugarit, a city-state on the coast of Syria. “There is famine,” he wrote. “If you do not quickly arrive here, we ourselves will die of hunger.”

A long drought had left the hinterlands around Ugarit in a state of famine, wars were brewing, and there were likely plagues as well. Urtenu may not have realized it, but he was living through the last years of two wealthy cities, Ugarit and Mycenae that dominated the eastern Mediterranean Sea during what historians call the Bronze Age, from roughly 3000 to 1200 B.C.E.

More than a thousand years before the Greeks invented democracy and the Romans undermined it with imperialism, these city-states of the Bronze Age laid the foundations for what is often called Western civilization. Homer recorded the myths of the Bronze Age in “The Iliad” and “The Odyssey,” and carved stone inscriptions of the pharaohs Hatshepsut and Thutmose III record the machinations of the Bronze Age elites. Although the rulers of the Bronze Age sometimes went to war, the true source of their power, like that of today’s biggest cities, was economic power secured through trade. The final decades of Ugarit and Mycenae tell us a lot about why cities fail — and who survives amid the ashes.

Ugarit and the Greek city-state of Mycenae were two of the most prosperous kingdoms in a thriving international economy that grew along coastal trade routes linking today’s Greece, Turkey, Syria, Lebanon and Egypt. Their markets sold everything from imported olive oil to local grain, while artisans crafted sculptures and weapons from the metal alloy that gave this period its name. Made with tin from Afghanistan and copper from Crete, bronze was the ultimate achievement of long-distance trade as well as technical know-how.

But the Bronze Age was also a time of extreme inequality. Cities were ruled by wealthy urban aristocrats who controlled trade, relied on various kinds of forced labor, and placed heavy tax burdens on their client states and agricultural villages. When times got hard, the commoners in Ugarit and Mycenae felt the squeeze.

Historians and archaeologists don’t know all the reasons these cities collapsed. But there is evidence that both burned to the ground in the 1100s B.C.E., their sumptuous palaces toppled and abandoned. There are signs of earthquakes, too. For centuries after these events, there are almost no written records. It was as if literacy and culture evaporated along with the kingdoms themselves.

Until recently, historians blamed this collapse on marauders known as the Sea People. Supposedly these Sea People sacked the cities, leaving the once-great kingdoms of the Mediterranean to be menaced by pirates or worse.

New research has challenged this whole story. Eric Cline, a classicist at George Washington University and author of "1177 B.C.: The Year Civilization Collapsed," explained that there's no evidence of invaders coming from the outside at Mycenae, so violence must have come from within. Given what's known about these societies, he concludes that the city's lower classes may have gotten fed up and burned it all down. Josephine Quinn, an archaeologist at University of Oxford, agrees. "The whole Bronze Age system produces a lot of discontent," she told me.

Mr. Cline and Ms. Quinn's work puts the achievements of the Bronze Age in a new light. The kings of Mycenae and Ugarit worked hand-in-hand with the wealthiest merchants to get rich. They consolidated economic and political power, to stamp out competition from smaller city-states or independent merchants. Mr. Cline described a letter from an Ugarit merchant named Sinaranu, who reported that he didn't have to pay any import tax when his boats returned from Crete loaded up with grain, beer and olive oil. Apparently, tax breaks for the rich are one of the oldest tricks ever invented by the ruling class.

When their cities were swallowed by fire, the Bronze Age ruling classes lost everything, including the subjects they once controlled. Greece's population dropped by roughly 50 percent during this time, probably because of a combination of war, drought and migration, according to Sarah Murray, a classics professor at the University of Toronto and author of "The Collapse of the Mycenaean Economy." Mr. Cline believes that plagues may have driven people into the hinterlands, too.

Still, it's unlikely that many of these people missed the old ways. "Were they ever concerned about whether the king was adequately supplied with fancy jewelry and ostrich eggs from Egypt?" Ms. Murray asked. "I'd bet that they were not. If anything, the demise of the palaces could have made life easier for them."

After the uprisings, the Mediterranean was no longer dominated by cities like Ugarit and Mycenae. Smaller cities such as Tyre and Sidon, which still stand in Lebanon today, emerged from the Bronze Age unscathed and became centers of culture in the region. It was as if the fall of New York and San Francisco left room for Philadelphia and Oakland to take up the slack.

The merchants of Tyre and Sidon thrived in this new world. They were local business owners with no formal affiliations or political ties. With the collapse of the old kingdoms, they had the freedom to sail unknown seas. Tyre's traders ventured much further than the representatives of Ugarit ever had, and settled in the territory that became Spain, Morocco and Tunisia.

In other words, the demise of Bronze Age civilization was not an all-out collapse. More accurately, it transformed the nature of political power in cities. Instead of a rigid, international power structure that controlled the whole eastern Mediterranean, there were local governments for each city-state.

One of the reasons historians call this transition period a "collapse" is that writing all but disappeared. Ms. Quinn said that may have been another sign of the anti-state protests. The kings of Ugarit and Mycenae kept a tight leash on their client states by using written records to track their wealth and levy taxes. Farmers and merchants, she said, might have stopped writing things down to evade the kings' control.

Writing returned to the region a few centuries after the fall of Ugarit, thanks to traders from Tyre and other independent cities. They used a form of writing that was phonetic, based on sounds rather than logographs like Egyptian hieroglyphs. This script, dubbed Phoenician, was easy to learn, easy to adapt to local languages, and became the basis for the modern Roman alphabet we use today.

As we live through what could be the first big cataclysm of the third millennium, the people of the late Bronze Age have something to teach us. "Invest in the local community, because no matter who is in charge at the top, local business are likely to survive," said Ms. Quinn. Of course, she added, the ultrarich companies will survive, too. The biggest traders of Ugarit didn't disappear, because they had political connections in the surviving cities like Tyre. Their fancy homes may have burned down, but they could afford to buy new ones.

Will we face a violent uprising in the wake of economic collapse? Perhaps, but today's 1 percent might not suffer the way Bronze Age kings did. For one thing, local trade networks are no longer as robust as the ones that existed in 1000 B.C.E., when merchants from Tyre traded with nearby villages, who then traded with other neighboring towns. "We really have demolished local manufacturing and supply systems," Ms. Murray said. "It is a bit sad to reflect on the contrast between the Bronze Age case, in which a few elites bore the brunt of the suffering."

These days, local traders and small towns depend on international supply chains as much as the kings of Ugarit did. One thing remains certain. Our survival still depends on sustainable local networks, and not tax breaks granted by kings.

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Please visit the site: https://www.nytimes.com/2020/05/11/opinion/coronavirus-inequality-history.html?action=click&module=Opinion&pgtype=Homepage

ISRAELI ARCHAEOLOGISTS FIND HIDDEN PATTERN AT 'WORLD'S OLDEST TEMPLE' GÖBEKLI TEPE, BY ARIEL DAVID

Neolithic hunter-gatherers who erected massive monoliths in central Turkey 11,500 years ago had command of geometry and a much more complex society than previously thought, archaeologists say

The enigmatic monoliths built some 11,500 years ago at Göbekli Tepe have been puzzling archaeologists and challenging preconceptions about prehistoric culture since their discovery in the 1990s. Chiefly, how could hunter-gatherers with a supposedly primitive societal structure build such monumental stone circles on this barren hilltop in what is today southeastern Turkey? How could a largely nomadic society at the dawn of agriculture marshal the resources and know-how to create what its discoverers have dubbed the oldest known temple in the world?

If anything, a discovery by Israeli archaeologists suggests the Göbekli Tepe construction project was even more complex than previously thought, and required an amount of planning and resources thought to be impossible for those times. Their study of the three oldest stone enclosures at Göbekli Tepe has revealed a hidden geometric pattern, specifically an equilateral triangle, underlying the entire architectural plan of these structures.

This implies that, in contrast to the prevailing assumption among Göbekli researchers until now, these three circles were planned as a single unit and possibly built at the same time, say archaeologists Gil Haklay and Avi Gopher of Tel Aviv University.

Thus, thousands of years before the invention of writing or the wheel, the builders of Göbekli Tepe evidently had some understanding of geometric principles and could apply them to their construction plans, concludes the study published in January in the Cambridge Archaeological Journal.

"The initial discovery of the site was a big surprise and we are now showing that its construction was even more complex than we thought," says Haklay, an Israel Antiquities Authority archaeologist and a PhD candidate at Tel Aviv University.

The first phase of construction at Göbekli Tepe, or "potbellied hill" in Turkish, has been dated to between 12,000 and 11,000 years ago.

This is the earliest part of the Neolithic, also known as Pre-Pottery Neolithic A (or PPNA), around the time people in the Northern Levant began domesticating plants and animals, launching the Agricultural Revolution.

The site's builders erected several concentric stone circles, setting into the walls massive T-shaped pillars that reached almost six meters in height, many of which were decorated with reliefs of animals and other motifs. These circles appear to have been built around pairs of pillars positioned roughly in their center.

Only four circles from the PPNA, dubbed enclosures A, B, C, and D, have been excavated so far, but surveys have shown there are at least 15 more scattered around the hill, as well as half a dozen other similar unexplored sites across southeastern Turkey.

An unexpected pattern

The new study focused on enclosures B,C, and D, which are known to be slightly older than A. Based on the assumption that such a massive construction project would have been beyond the capacities of the small, non-sedentary groups that usually comprise hunter-gatherer societies, most scholars have assumed that all the circles at Göbekli Tepe had to have been built gradually over a long period of time.

“There is a lot of speculation that the structures were built successively, possibly by different groups of people, and that one was covered up while the next one was being built. But there is no evidence that they are not contemporaneous,” Haklay tells Haaretz.

Haklay, who formerly worked as an architect, applied a method called architectural formal analysis, which is used to trace the planning principles and methods used in the design of existing structures.

Using an algorithm, he identified the center points of the three irregular stone circles. Not surprisingly, those points fell roughly mid-way between the pair of central pillars in each enclosure. What was surprising, however, was that those three points could be linked to form a nearly perfect equilateral triangle. Specifically, the vertices are about 25 centimeters away from forming a perfect triangle with sides measuring 19.25 meters each.

“I certainly did not expect this,” Haklay recalls. “The enclosures all have different sizes and shapes so the odds that these center points would form an equilateral triangle by chance are very low.”

The finding confirms previous research by Haklay and Gopher at other sites showing that architects in the Neolithic or even in the late Paleolithic didn’t build shelters and homes haphazardly but had the ability to apply rudimentary geometric principles and create standard units of measurement.

At Göbekli Tepe, the discovery of the pattern is evidence of a complex abstract design that could not be realized without first creating a scaled floor plan, Haklay says. At a time when the invention of writing was millennia away, this could be accomplished, for example, by using reeds of equal length to create a rudimentary blueprint on the ground, he suggests.

“Each enclosure subsequently went through a long construction history with multiple modifications, but at least in an initial phase they started as a single project,” the archaeologist concludes. “The implication is that a single project at Göbekli Tepe was three times larger than previously thought and required three times as much manpower – a level that is unprecedented in hunter-gatherer societies.”

Suddenly, social stratification

The construction would have required hundreds or maybe thousands of workers and could be taken to mark the birth of a more stratified society, with a level of sophistication previously seen only in later, sedentary groups of farmers, says Gopher, an archaeology professor at Tel Aviv University and Haklay's PhD advisor.

"This is where it starts: The sharing instinct of hunter-gatherer societies is reduced and inequality is growing; someone is running the show – I don't know if it's shamans or political leaders, but this is a society that has an architect and somebody who initiates a project like this and has the power to make it happen," Gopher says.

The new study is "an amazing contribution to the understanding" of this enigmatic site, says Anna Belfer-Cohen, an archaeology professor at the Hebrew University in Jerusalem and an expert on late prehistory. However, given that there are many stone circles at Göbekli Tepe and other sites nearby that have yet to be excavated, we don't know if the same conclusions can be applied to all these enclosures, cautions Belfer-Cohen, who did not take part in the study.

"These three enclosures may have been built together, but it doesn't mean that the others were not constructed as single units, perhaps by different groups," she says. "We have only uncovered the tip of the iceberg of this phenomenon, but it is more likely that there were many different groups that considered this entire area sacred and converged on it to erect the enclosures, rather than a single group that went crazy and just constructed these complexes day and night."

The new world order

How and why Neolithic hunter-gatherers would mobilize the massive resources needed to build Göbekli Tepe and other sites like it is the subject of much speculation. While some researchers have interpreted the structures as residential spaces, most archaeologists see little evidence of this and consider the sheer monumentality of the complex and the richness of its iconography as evidence of a ritual purpose.

The massive T-shaped pillars and the reliefs on them – animal and human-like - have been interpreted as totems: perhaps representations of protective spirits, possibly long-deceased ancestors, some of whom were believed to take on animal form. The idea that the zoomorphic and anthropomorphic images may represent the venerated dead was reinforced by the recent discovery of modified skull fragments buried at the site, which many researchers consider to be evidence of ancestor cults (similarly to the interpretation of stone masks found throughout the Levant from about 9,000 years ago).

The identification of the hidden geometrical pattern strengthens the interpretation of Göbekli Tepe as a cultic site, say Haklay and Gopher. The southern side of the triangle runs through the central stone pillars of enclosures B and C, creating a base for the polygon.

The axis perpendicular to this line runs through the entire site and ends in the center of enclosure D, which can be interpreted as the top of the pyramid.

This suggests that the builders understood and wished to represent the idea of a hierarchy, perhaps intending to crystalize the new order of a less equal and more stratified society, Haklay and Gopher maintain.

The stratification was not limited to human relations: it suggests a change in the perceived relationship between humans and nature, the archaeologists suggest. That's because of what is found at the top of the triangle, at the center of enclosure D.

While the site's signature T-shaped pillars have all been interpreted as stylized human figures, the central monoliths of enclosure D are the only ones that are clearly anthropomorphic, bearing reliefs of hands, a belt, and possibly a loincloth. Placing these human depictions at the top of this triangle would have been a powerful message, and represented an ideological departure from the animal-centric canons of Paleolithic art.

"In Paleolithic art humans are rare, and this is true here as well, but you start to see change, the beginning of an anthropocentric world view in which animals and plants are no longer equal to humans but are subordinated to them," Gopher tells Haaretz.

In other words, Göbekli Tepe may have been designed, consciously or unconsciously, to represent and perhaps explain humanity's growing ability to manipulate its environment, which, in the coming centuries, would lead to the first domesticated crops in this very region, the researchers say.

"The end of the hunter-gatherer lifestyle is more of an ideological transformation than an economic or technological one," Gopher maintains. "Hunter-gatherers cannot domesticate anything, it's against their world view, which is based on equality and trust. Once that ideology changes, the entire structure of society is transformed and a new world is born."

Please visit the site: https://www.haaretz.com/archaeology/.premium-israeli-archaeologists-find-hidden-pattern-at-gobekli-tepe-1.8799837 [Go there for pix]

THE DOLMEN TOUR AND HOUSE OF HERITAGE IN MENJEZ (AKKAR – NORTH LEBANON), BY TARA STEIMER-HERBET

The megalithic heritage of the Middle East and many parts of the world is frequently neglected and consequently has been subject to extensive damage. Preserving and studying that heritage is critical for scholars and communities alike. Lebanon's megaliths are no exception.

Preservation and protection of 11 dolmens, situated in Menjez, North Lebanon (Akkar), was carried out between April 2018 and December 2019, a project funded by the British Council – Cultural Protection Fund (BC-CPF). It was implemented by four partners, the University of Geneva, the Municipality of Menjez, the Museum of Lebanese Prehistory and the Château-Musée of Bélesta (France), under the supervision of the Directorate General of Antiquities in Beirut, and with the active involvement of the local Menjez community.

The project was prepared in response to a call for proposals issued by the BC-CPF in the spring of 2017, targeting cultural heritage under threat in the Middle East and North Africa. The preservation of the megalithic monuments of Menjez, which date from the Chalcolithic to the Early Bronze Age period (approximately 4000-2500 BCE), seemed like a perfect fit under the objectives. The project was designed to protect, analyze, and preserve 11 megalithic monuments situated in the village of Menjez, in the basaltic mountains of the Akkar.

The vestiges of the megalithic monuments are spread all over the village, on both private and state-owned land. Unfortunately, they are not under the jurisdiction of the Ministry of Antiquities, and extensive agricultural activities have endangered their existence. In 1960, when the Jesuit Father Maurice Tallon arrived in the region to undertake his first excavations, he counted no less than a hundred monuments. Today there are only 40 left.

The project itself was straightforward. It consisted in the selection of a group of dolmens on state land, their analysis and promotion, and in training two people from Menjez to become" cultural animators," educator-motivators, guiding groups through visits of the megalithic monuments. The aim was not only to protect, record, and preserve the megalithic edifices, but also to help the municipality of Menjez open a Heritage House, in order to familiarize the community regarding their heritage.

The two animators are now capable of guiding tours through the dolmen path. They have also been trained how to lead workshops for schoolchildren in the Heritage House. By sensitizing the local population to their own heritage, it is also hoped that the destruction of the megalithic monuments situated in private land will stop, and that we will be able to demonstrate the value of preserving monuments by generating revenues for the surrounding communities.

Tourism in the Akkar region never grew after the Lebanese Civil War began in 1975. Despite the fact that Menjez and the Akkar region are impoverished, the government has

provided little support for socio-economic development. To make matters worse, the refugee crisis resulting from the Syrian war has further weakened the region. This part of Lebanon has been declared a 'red zone,' which deters travellers from visiting the area. As a consequence, the region is not considered a top priority for tourism, which understandably focuses on sites that have a higher economic potential. Nonetheless, Menjez stands out as a unique architectural and cultural heritage site in Lebanon, and deserves close attention.

The tombs are built of basalt stone slabs, an abundant raw material in this region of Lebanon, with many basalt outcrops readily furnishing building material. The topographic distribution of the monuments is repetitive. They are built on flats, slopes, or slope ruptures and are generally placed several dozen meters apart. All tombs have an access corridor, usually oriented towards the south.

Inside, raised stone slabs averaging 1.6m in height delimit the space dedicated to the dead. These stones rest upon a pavement, with the largest stones maintained by smaller blocks. Orthostats lean on this pavement, implying a construction sequence: first the pavement, then the tomb itself. The enclosures are built of massive blocks, and it is possible they were erected later.

It is hoped that protecting and popularizing the megalithic monuments with a dolmen tour will promote tourism in the area, bringing benefits to the local community and attracting more funding for preservation of additional prehistoric sites, restoration of the Roman Temple, and the Crusaders fortress.

An increased number of visitors to the village will also provide economic stimulus that will help sustain the heritage of Menjez.

Residents will reap the rewards from maintaining a healthy environment and will also gain a sense of pride that will also serve to promote sustainability.

Beyond the popularizing and protecting the megalithic monuments, the aim of the project was to motivate the people of Menjez to take matters into their own hands, since many local farmers actually own megalithic monuments on their lands. As such, it was of particular importance to sensitize them to the heritage they possess and represent. The implementation of the project was a successful step in that direction. Cleaning, studying and covering with decorative gravels, eleven monuments may now be visited in the dolmen tour.

The project also collected new data regarding the prehistory of the region, and the University of Geneva is engaged in a 3D visualization project.

If the project had not been implemented, eventually the megalithic monuments would have been lost; local farmers need more land and are slowly, inexorably destroy the monuments. If no efforts are made to preserve them, the condition of the dolmens will worsen, and all traces of this prehistoric heritage could be lost. More efforts are needed in the near future, but the implementation of this project provided a clear example of what a solid, community supported, private/public partnerships can achieve, and how it can benefit all parties involved.

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Please visit the site: http://www.asor.org/anetoday/2020/04/dolmen-tour-lebanon
[Go there for pix, map, an better format]

RARE FIGURINES UNCOVERED AT LOST BIBLICAL CITY

Ancient artefacts dating back 3,300 years have been unearthed by Macquarie University archaeologists at a long-lost city believed to be linked to King David.

A rare 'smiting god' figurine, a bronze calf figurine, two seals and decorated Canaanite and Philistine pottery from the 12th Century BCE were discovered at Khirbet el-Rai in Israel by a team of 32 Macquarie University students and three high school teachers during a three-week excavation in February.

The students, from Macquarie University's Ancient Israel Program, have been excavating the 1.7 hectare site in partnership with The Hebrew University of Jerusalem and the Israel Antiquities Authority.

The Macquarie archaeology students were delighted when they unearthed the bronze figure of the Canaanite god Baal, poised to smite his enemies, and a small bronze calf, bringing images to mind of the biblical 'golden calf'.

"When we go on an archaeological excavation, we have high hopes and low expectations but of course it's wonderful when we make exciting finds," said Dr Gil Davis, Director of the Ancient Israel Program at Macquarie University.

"We dream of making discoveries that will change our understanding of a significant part of the ancient past."

Dig co-director Professor Yossi Garfinkel, Head of the Institute of Archaeology at The Hebrew University of Jerusalem, says the partnership with Macquarie University has enabled them to excavate on a much larger-scale than usual. "Most of the discoveries at this site are thanks to the cooperation of Macquarie University."

For three weeks from 26 January to 13 February 2020, the team worked in the warm winter sun to dig, sift and discard bucket-loads of soil to unearth these artefacts at two different locations on the site.

It follows the team's groundbreaking claim that this site was once the ancient Philistine city of Ziklag mentioned in the Bible's Book of Samuel.

Lost city found

According to the Bible, the Philistine King Achish of Gath gave Ziklag to David — renowned for slaying the giant Goliath (1 Samuel 17) —while he was fleeing King Saul. Later, after Saul's death, David became king in Hebron and Ziklag remained in the hands of his nascent kingdom of Judah.

The city's true whereabouts have remained unknown for centuries, until now.

The team's excavations have revealed layers from the 12th–10th Centuries BCE, which covers the city's Canaanite foundation and rule by the Philistines as well as the Israelite Kingdom of Judah. They have also found evidence of a fierce fire, burnt mud bricks, white ash, burnt wood and numerous destroyed ceramic vessels – which coincides with the biblical account of the city being raided by the Amalekites.

Scholars have been divided over the location of Ziklag, with as many as 12 potential sites put forward as contenders. But Garfinkel and co-director Dr Kyle Keimer, Senior Lecturer in the Archaeology of Ancient Israel at Macquarie University, say the assembled evidence gives Khirbet el-Rai a strong claim to be the lost biblical city.

"Our site is chronologically the right time period and as we've excavated and discovered how significant this site was from a political and economic and geographical stance, we sought to identify it with a biblical site," explains Keimer.

"I wholeheartedly think that it's a very feasible explanation, particularly in comparison to the other sites which have been proposed, all of which have one issue or another with them whether it be chronological, archaeological or geographical."

The site has yielded a wealth of artefacts including rich finds of Canaanite pottery, vessels used to store oil and wine, a stash of flint 'blanks' used for sickle blades, inscriptions, oil lamps, a portable shrine and even a large bronze spearhead.

The team has uncovered a series of superimposed monumental buildings as well as multiple domestic buildings. The earliest of the monumental buildings was destroyed, preserving a room full of burnt bones and cultic objects, some of which find their origins in Cyprus. The architecture and small finds indicate that a sophisticated society with international connections was in existence at that time (the Iron Age I), rather than modest scattered settlements as scholars previously thought.

The dig is also unique in that the 32 students from Macquarie's Ancient Israel Program have been given the chance to make their mark on history by gaining hands-on experience in the field. Six were specially selected as mentorees and paired with an Israeli supervisor to learn how to manage and run their own excavation square.

"It's so exciting and I've learnt so many things that I never even thought were part of archaeology," says mentoree Eva Rummery.

"In order to write the history you need to understand it from your own perspective, actually see it for yourself and experience it yourself, and that means you can not only write it so much more accurately but you can get your own feeling of what's happening. And it connects you back to the geography of the place, how the environment works, which is so important because that puts you in the life of the people who originally lived here."

Mentoree Michaela Ryan says the dig creates opportunities for participants to pursue future study.

"I think you need to understand not just the theories and what we learn from a textbook but the actual practical experience behind it – it will help me immensely in going into postgraduate studies in the field," Michaela said.

The entire experience instills the students with an "invaluable work ethic" going forward, said Davis. "These are bright and engaged students already but the experience of working as a team, having to problem solve, having to deal with difficult conditions, having to relate to different cultures and languages changes them, and after the dig their motivation and their grades are enhanced," Davis said.

Chemistry lab a field first

In another major innovation, the students have been trained in sampling for residue analysis using an on-site chemistry laboratory overseen by Dr Sophia Aharonovich.

They have been taught how to collect soil samples from different locations and carry out six chemical tests on each one to get immediate preliminary results in the field. These results can show whether there was human activity (such as cooking or sleeping) and organic material (such as remnants of oil and wine) in a certain location, giving a clearer understanding of what each area was used for in ancient times.

"We are bringing colour, taste and smell to the dry walls and rooms we are uncovering here on the site," explains Aharonovich.

Macquarie University has been excavating at Khirbet el-Rai since 2018, with the dig funded by the Roth Families of Sydney and the on-site chemistry laboratory funded by Isaac Wakil in memory of his late wife Susan.

Please visit the site: https://www.heritagedaily.com/2020/04/rare-figurines-uncovered-at-lost-biblical-city/127574

ISRAELI ARCHAEOLOGISTS SOLVE MYSTERY OF PREHISTORIC STONE BALLS, BY ARIEL DAVID

Shaped stone spheres were part of early humanity's toolkit for over two million years, but what exactly they were used for has remained an enigma. Until now.

Stone artifacts painstakingly shaped into spheres were part of the daily lives of early humans for more than two million years. They have been unearthed by archaeologists in East Africa, humanity's ancestral home, and they litter prehistoric sites across Eurasia from the Middle East to China and India. Yet experts have been puzzled by their function since the early days of research into our evolutionary history.

Now, an international team of archaeologists led by Tel Aviv University archaeologist researcher Ella Assaf, has produced evidence that these enigmatic artifacts were used for a very specific purpose: breaking the bones of large animals to extract the nutritious marrow inside.

The study, published last week in the journal PLOS ONE, highlights how an elegant technological solution that allowed hominins to increase their calorie intake endured for hundreds of thousands of years and continued to be used even as our ancestors developed new techniques and created more complex societies.

The researchers analyzed shaped stone balls, also called spheroids, found in Qesem Cave, a prehistoric site just east of the modern city of Tel Aviv that was inhabited from 400,000 to 200,000 years ago. The discovery of around 30 of these artifacts in this particular cave was a puzzle wrapped in an enigma for archaeologists. Not only did the function of the spheres remain obscure, but their presence there was considered anachronistic, because these artifacts are usually found at much older sites.

Mastery of fire

Qesem Cave was uncovered during road works in the year 2000. Since then, excavations led by Tel Aviv University archaeologists Avi Gopher and Ran Barkai has uncovered a treasure trove of hundreds of thousands of flint tools and animal bones as well as 13 hominin teeth, belonging to the as-yet-unidentified group that lived at the site.

Whoever they were, these distant ancestors of ours were relatively ahead of their time in much of the behavior they displayed, experts say. The people of Qesem Cave (whose modern name somewhat appropriately means "magic" in Hebrew) were among the first hominins to master controlled fire to cook meat, and they learned how to preserve food for a rainy day.

The locals were also capable of producing sophisticated stone tools and pass on their knowledge to the next generation by schooling children in the art of flint knapping.

Initially, archaeologists were a bit surprised by the presence at Qesem of stone balls, which are generally associated with an earlier chapter in our evolution, explains Assaf.

These spherical objects first appear in Africa at sites that are nearly 2.6 million years old, often in association with Homo erectus.
They were found, among others, at excavations in Tanzania's Olduvai Gorge by Mary Leakey, the renowned British archaeologist.

In a 1971 book, Leakey suggested these artifacts may have been used as primitive bolas to hunt animals, while other researchers have speculated they may have served as projectiles, hammer stones or grinding tools.

In the Middle East, the spheres appear at sites dated to between 1.4 million and 500,000 years ago. So by the time hominins first entered Qesem Cave, these artifacts had fallen out fashion by at least 100,000 years in this region.

It turns out that their presence was linked to another behavior that researchers have spotlighted at Qesem: recycling. The residents of the cave, as well as other prehistoric populations, were very dedicated to collecting, retouching and reusing old tools, possibly made by even earlier groups of hominins.

"In Qesem we see a regular pattern of collecting stuff from outside the cave and reusing it," Assaf says. In other words, the stone balls were not made at Qesem: they were spotted at nearby, likely much older prehistoric sites – of which there are several known to archaeologists in the area – and brought back to the cave. We know this because the stone balls are made of dolomite or limestone of a kind not present in the immediate vicinity of the cave, Assaf says.

The artifacts also have a patina, a nacreous layer that forms on objects as a result of chemical reactions when they are exposed to the elements, that is different from that of other tools that were found in the cave. This means that the balls were exposed to a different environment for a very long time before being brought into Qesem.

Fragile balls

So why did these hominins visit ancient sites and carry back home stone balls that weighed up to a kilogram each? Were they perhaps attracted by the craftsmanship and the symmetric beauty of the spherical shapes?

While previous research by Assaf has suggested that the people of Qesem liked to collect shiny, colorful pebbles purely for their aesthetic value, this is not the case for the spheres, the researchers conclude.

In the PLOS ONE study, microscopic analysis of the organic residues and the signs of wear on the Qesem spheres was conducted by Isabella Caricola and Emanuela Cristiani, of Rome's La Sapienza University.

The artifacts are not perfect spheres, and their creators intentionally maintained some rough ridges. It was around these wide angles that the signs of wear on the stones were concentrated, along with residues of fat, collagen and bone. This suggested that the

stones were used to crack open large bones (such as from elephants) and extract the marrow, Assaf says.

To verify that hypothesis, Javier Baena of Madrid's Unversidad Autonoma produced modern versions of the stone balls and Jordi Rosell, of the The Catalan Institute of Human Paleoecology and Social Evolution in Tarragona, Spain, tested them by breaking open modern animal bones. The residues and the signs of wear on the reproductions matched those on the original spheres, the team found.

The experiment also highlighted why the people of Qesem would recycle used spheres rather than make their own, Assaf says.

"Javier can knap with his eyes closed, but he still struggled. It's very difficult to make such objects," she says. "One little mistake and the sphere can break in half, or you can keep fixing the ridges and end up with a very tiny, useless ball," the archaeologist says.

The ridges on the tool were all-important features because they made it more accurate, opening the bones with a clean break and without mashing the precious spongy tissue inside.

No need to reinvent the wheel

Assaf does not rule out that the symmetry of the spheres was considered aesthetically pleasing by those wielding them, or that collecting old tools may have also been a display of respect for the distant ancestors who created them. Most likely, the interest in these artifacts mixed form and function.

"The people of Qesem used advanced and innovative techniques, and had a very wide tool kit, but sometimes having knowledge and skill means picking up something old and reusing it because it's still useful,"
the archaeologist adds. "Being smart also means acknowledging that those who came before you were smart too: you don't have to reinvent the wheel every time."

Being composed mainly of fat, bone marrow was an important source of calories for prehistoric populations, and could easily be preserved inside the bone for times when food was scarce, which, as previous research has shown, the Qesem people probably knew how to do.

"The spheroids phenomenon is a big puzzle that we don't understand, and there has been very little research on their function," says Ofer Marder, an archaeologist from Ben-Gurion University in Be'er Sheva and an expert on prehistoric tools. "Combining the analysis of residue and wear with experimental archaeology is a breakthrough in determining the connection between these tools and their use."

We also cannot rule out that the spheroids may have been used for other purposes as well, such as processing plant material, notes Marder, who did not take part in the study.

"Most prehistoric tools were more like a Swiss Army knife and didn't have a single function," he says. "More research is needed in order to understand if the tool had other,

possibly more complex, functions and whether the conclusions of this study can be applied to spheroids found elsewhere."

The evidence that the stone spheres functioned as marrow-extractors is, strictly speaking, only applicable to their use in Qesem, Assaf agrees. In other words, there is no direct proof that their original makers intended them for the same purpose, or that the other spheres found across Africa and Eurasia were used thusly.

"We cannot be sure yet, but my assumption is that this was always their main function, because they are so efficient when you use them for this specific purpose," Assaf says, adding that she is already planning to test that hypothesis on other stone balls from different sites.

Please visit the site: https://www.haaretz.com/archaeology/.premium-israeli-archaeologists-solve-mystery-of-prehistoric-stone-balls-1.8766225 [Go there for pix]

"TERMINATE AND LIQUIDATE": HOW THE MEGIDDO IVORIES WERE ALMOST NOT DISCOVERED, BY ERIC H. CLINE

At the end of the first week in May 1936, John Wilson, who had just taken over as Director of the Oriental Institute at the University of Chicago, sent a cable to Gordon Loud and the team of archaeologists excavating at the site of Megiddo, in British Mandate Palestine.

regret another megiddo season impossible expedition terminating now stop can you remain to liquidate house and equipment… [please] advise antiquities department of termination

A longer letter was sent the same day. In it, Wilson explained that the Institute administration had been trying for three weeks to figure a way out of a drastic financial dilemma, but had finally concluded that they had to close down all of their excavations immediately, rather than allow them to continue for another year.

What had happened was simple, but entirely unanticipated. In the wake of the sudden death the previous December of James Henry Breasted, the founder and long-time Director, the three Rockefeller foundations which had been financing the Institute and its excavations since the beginning, asked Wilson to come up with a plan in which the overall $700,000 annual budget was drastically reduced by 50 percent or more and the field projects similarly cut to the bone or shut down completely. With Breasted no longer around to personally defend the various overseas undertakings, Wilson had no choice but to comply.

For the small team at Megiddo, this was the end of the world as they knew it; it was their own personal Armageddon. There had been Chicago excavators surveying and digging at Megiddo every year since 1925, but this was apparently the end of the road. More cables, some in code, flew back and forth across the Atlantic in the next several days—three from Loud to Wilson alone. In them, Loud tersely told Wilson that he and the others would remain at the site as long as necessary to liquidate everything. He also asked, plaintively, whether they might excavate for one more season after all, on a shoestring budget of $20,000, but Wilson replied that was impossible.

However, Loud soon informed Wilson that the local conditions were so unsettled that liquidating the dig house and all their equipment would be difficult. He followed up almost immediately with another cable, this time in code, stating that the growing disturbances actually made liquidation totally impossible, and that the government thought the situation could last for weeks. He recommended that they postpone the liquidation until the fall, if things had calmed down by then.

As it turned out, the "disturbances" lasted for a full six months; they marked the beginning of what is now known as the 1936–39 Arab Revolt in British Mandate Palestine. Loud recorded some of the events in his field diary. On 19 April, he noted: "The Garstangs drop in for five minutes after tea . . . but all are whisked away in a hurry

by police. Riots are under way in Jaffa and Tel Aviv, and the police are taking precautions in keeping people off the roads here. So far Haifa remains quiet." The next day he wrote that it remained to be seen what effect the riots would have on them locally. By 22 April, he noted that the riots were quieting down and had not affected their local work situation.

What Loud and the others were experiencing at the time was just the opening stage, which soon morphed into a general strike that lasted from May to October 1936. A second, more violent and deadlier, phase would begin a year later, in the fall of 1937, after the Peel Commission released its findings in July of that year, concluding that British control of the area could not be sustained, and proposing a partition—dividing the land between the Arabs, who would receive 80 percent, and the Jews, who would receive 20 percent. The Peel report led to an escalation of the protests, which lasted until 1939 and resulted in an eventual death toll estimated at 150 British soldiers, 500 Jews, and more than 3,000 Arabs. However, that still lay a bit in the future at this point.

On 12 May, Loud made his way down to Jerusalem. The next morning he went to see Ernest Richmond, the director of the Department of Antiquities. Since Richmond was unavailable, Loud met with Richard W. Hamilton, the acting director, and told him that they were finished, not just for the season, but forever. The message resonated with Hamilton, for he had been a member of the Megiddo team for a few weeks back in 1929. A handwritten note that Hamilton penned to Richmond later that same day captures Loud's reluctant message: "The Oriental Institute has officially closed down the expedition to Megiddo. They are packing up everything except pictures, plants, etc. Mr. Parker will return in the autumn to wind up their affairs. . . . Mr. Loud wishes to keep the matter of the closing of the dig confidential for the present."

However, the expedition reversed course from potential termination so quickly that word does not seem to have spread far, if at all. Wilson decided that they would be able to allocate $28,000 toward a field season at Megiddo for 1936–37 after all. First, though, they had to make certain that they could get permission to dig again. In early September, Loud sent letters to Richmond, in his role as the director of antiquities, and to the chief secretary in Jerusalem. He explained that recent developments had made another season at Megiddo possible after all, and that they would like to postpone the liquidation and instead dig again beginning in November or December.

Richmond replied positively, so the only thing that Loud had to do now was wait to see whether the general strike would eventually come to an end, allowing them to begin work. He sent cables to Richmond inquiring about the conditions in mid-October and then again in late October, finally receiving a positive reply: "as at present advised work resumeable december." Richmond also sent a license for Loud and the OI to dig, valid for one year (as per usual), through the end of December 1937.

The dig officially began again on 19 December, less than six months after it had been scheduled for termination and liquidation. It was later in the year than they had ever begun before—in previous years they would have been closing down around this time for the winter break, but now they were just getting started.

It was now dangerous to travel at night, though, for fear of being held up by bandits, and trips to Jerusalem could be done safely only in broad daylight. As it turned out, although

Wilson continued to be concerned about the political situation, Loud and the others seem to have had no problems during the entire season—or at least none that they reported.

In late January, Loud sent a long missive to Wilson, which began with his blatantly stated desire that they would find something sensational soon: "Your desire for the sensational from Megiddo is no greater than mine," he wrote. "Something startling would certainly be a big help. My greatest desire for the moment, however, is for a break on the weather so that we might dig to the pot of gold, whatever form it may take."

As it turned out, Loud's letter wishing for the "sensational" was prophetic. The clouds eventually parted, the sun came out, birds started singing, and so forth, and toward the end of February, Loud was able to write to Wilson saying that the north area, which he had previously perceived as dull and troublesome, "now takes its full share of interest." As he described it, the Late Bronze Age palace was proving to be both extensive and magnificent, with walls standing as high as four meters in some places and covered with painted mud plaster.

There was also a "floor of shells which gives the appearance of a mosaic pavement." Furthermore, the team began finding pieces of carved ivory, some with incised Egyptian hieroglyphics and others decorated with elaborate designs. Soon these initial pieces would be joined by a host of additional artifacts, in the form of a hoard of gold objects followed immediately by a treasure trove of ivory objects. All were found within just a few rooms of the palace in the north area and made this "a most successful season," as Wilson later put it. In early March, Loud wrote, "There can no longer be any doubt of the importance of this mound."

They found the first pieces on the first day of March. In his field diary entry the next day, Loud wrote: "Full work the past three days, but so many extras to attend to that non-essentials must slide. All this largely due to what is probably the find of the season—a hoard of gold jewelry, vessels, etc in 3100—an outer room of the north palace. So rich, so varied, and so fragile are the finds that there is infinite work in removing and cleaning them. It began yesterday morning when a shell-shaped dish in which was a green stone jar capped with gold first appeared."

Stratum VIII gold hoard under floor of Room 3100.

Four days later, he sent a coded cable to Chicago, announcing the find. When decoded on the other end, the message read:

stratum eight palace produces magnificent egyptian gold hoard:
—fluted shell-shaped bowl, perfume jars, jewelry, etc.
18th dynasty context [but] style suggests partly middle kingdom origin. unparalleled this country.

Loud also sent a much longer letter later that same day, with all of the details. It began: "Dear John: In one of your letters, you asked for the sensational. If I'm not very much mistaken, I think this is now a fait accompli." Specifically, they had found a hoard of gold and ivory treasure deliberately buried under the floor in the southwest corner of a small room (3100) located at the northern end of the palace. The pieces were amazing, "a magnificent collection, absolutely unique in Palestine."

However, all of that was just the appetizer. The main course was yet to come, for it subsequently turned out that there was more than just the gold hoard in this palace. In fact, what they found next eclipsed the hoard almost entirely, at least in terms of discoveries that are today most frequently cited and discussed when it comes to Megiddo.

In the same letter that he sent to Wilson in early March, Loud reported that they were clearing three other rooms, which were turning out to be "veritable mines" of ivory objects. In just one corner of one room, they found "combs, spoons, plaques, medallions, etc. all helter skelter with skeletons of a child and a young camel plus another human skull, and more camel skull!" One of the nicest pieces was still half-buried, he said, but seemed to be part of a cup or goblet with an exquisitely carved design of pomegranates and

Loud rarely used exclamation marks in his letters, so he must have been truly excited when he wrote all of this. He later explained to Wilson that he had been tempted to send a cable about the discovery of the ivories as well but had refrained "less the shock of so much from Megiddo might be too much for you." He also told Howard Matthews, who was in charge of financial matters at the Oriental Institute at the time, that since sending his cable about the gold, which Matthews had been the one to decode back in Chicago, the ivories "have so far surpassed the original find that they, rather than the gold, now take first place."

They had found the famous Megiddo ivories.

It took them more than a month of work, from 6 March until 7 April, just to carefully excavate and remove all of the ivories, all the while entertaining visitors who came to see their finds, including some of the best-known archaeologists working in the area, from the revered Sir William Matthew Flinders Petrie (British archaeologist and Egyptologist extraordinaire) to Nelson Glueck (later president of Hebrew Union College), Eliezer Sukenik (later renowned for purchasing and translating the first three Dead Sea Scrolls), Olga Tufnell (who was excavating at Lachish with James Starkey), and Gerald Lankester Harding (director of the Department of Antiquities of Jordan at the time). Removing the ivories was an elaborate and time-consuming process that involved using celluloid to harden or piece together the fragments; applying solvent to soften the dirt that remained attached; and occasionally sticking paper to the fragments, again using copious amounts of celluloid, which could later be easily peeled off.

Early on, Loud estimated that there were more than a hundred "first-class pieces." In fact, there are closer to four hundred pieces all told, including items that Loud thought had "Egyptian, Syrian, Cretan, and Assyrian motives." He was correct—later scholars have confirmed the international nature of this collection, detecting Hittite, Mycenaean, Egyptian, Ugaritic, Canaanite, and Assyrian motifs. They found so many ivories that Loud had to hire a photographer named G. Eric Matson, from the American Colony in Jerusalem, to help out with all of the documentation.

The gold hoard and the ivory treasure found during the spring of 1937 turned out to be the high point of Loud's four seasons of excavation, in terms of glittering items that would catch the public's imagination. However, his final seasons proved to be just as important to the overall aims and goals of the expedition. It was during that time they

were able to finish digging all the way down to bedrock in Area BB—their east dig—and to complete their reconstruction of the entire occupational sequence of Megiddo, from the earliest indications of inhabitation in Stratum XX to the final abandonment of the mound after Stratum I.

Along the way, though, in these final seasons, they had to deal with the continued dangers that came with living in British Mandate Palestine during the Arab Revolt, which had begun with the general strike in 1936 and was now entering its final and most violent phase. For the team at Megiddo, this included a death threat against Loud, the attempted assassination of their good friend Harry Iliffe from the Antiquities Department, and the murder of an archaeological colleague, James Starkey, the excavator of Lachish, who was en route to the official opening of the new Palestine Archaeological Museum.

But those are stories for another time.

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This excerpt is from Digging Up Armageddon: The Search for the Lost City of Solomon (Princeton University Press, 2020). Footnotes or references can be found in the published book. Archival material and quotations are reproduced by permission of the Oriental Institute at the University of Chicago and the Israel Antiquity Authority, as described in greater detail in the book.

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Please visit the site: http://www.asor.org/anetoday/2020/04/terminate-liquidate Go there for pix and nicer format]

SCIENTISTS ARE TRACKING THE ANCIENT LUXURY MARKET FOR DECORATED OSTRICH EGGS "THIS IS A SHARED UNDERSTANDING OF BLING, OF WHAT IT MEANS TO BE RICH", BY ISAAC SCHULTZ

IN ALL OF THE FINDS from all the ancient treasure hoards and tombs from Mediterranean civilizations that have turned up over the years, there's a peculiar outlier. Among many, many funerary amphorae, pieces of gilt armor, and enticing piles of coins, there are also decadently carved eggs from the world's largest extant bird: the ostrich.

The human relationship with these eggs dates back 60,000 years in South Africa, where ostrich eggshell fragments have been found in places occupied by humans. They had a use as food—after all, one ostrich egg is the equivalent of two dozen from chickens—but also provided a durable, attractive canvas for human art. In the Bronze Age, large, intact eggshells were decorated with carved motifs of animals and warriors, painted accents, and metal inlays, and placed in tombs or used as ornamented goblets by the ruling class. For decades archaeologists have wondered just how these gigantic avian baubles came to be. Were the ostriches farmed? How did ancient Greeks and Spaniards get their hands on delicate, perishable goods from the Middle East and Northern Africa? And once acquired, how were the eggs crafted and decorated?

No ostrich egg workshops have been identified in the archaeological record, and their bones aren't found at ancient sites, further obscuring how eggs were sourced and then made into dazzling works of art.

But the hunt for more information hasn't all been a wild goose chase, as a recent study published in the journal Antiquity suggests. A British and German team set out to analyze five whole ancient ostrich eggs and innumerable ancient eggshell fragments in the collection of the British Museum. (So large are the eggs that the scanning electron microscope they used had to be customized, and even then there were problems.)

The recent study also made use of modern ostrich eggs, for comparison—and for protein.

"It makes a lot of quiches, cakes, and omelets to keep you going in the basement of the British Museum while you're looking at a scanning electron microscope," says Tamar Hodos, an archaeologist at the University of Bristol and lead author of the new paper. "We ate well for three days down there."

The results suggest a far-reaching geography to the ancient ostrich egg trade, as well as a complex chain of production. "We've just tended to focus on ostrich eggs turning up in elite graves, among the consuming cultural group," says Hodos, "But not so much from the perspective of the producing groups."

Today, an ostrich egg costs about as much as a boozy brunch for one.

But in antiquity, the carved eggs were luxury goods, status symbols for the Mediterranean elite. Rulers and aristocrats worth their salt, from Assyria to Etruria, all had at least a few of them. To hash out how they made it around the Mediterranean, the scientists had to get molecular.

Ostrich eggs are rather like trees. Both are organic and grow, soaking in information about their environments as they do so. Using a triumvirate of oxygen, carbon, and strontium isotope analyses, Hodos's team picked apart the climates in which the eggs were nurtured, and found that the eggs really got around.

"High-resolution microscopy has hardly been used for this region/periods," says Philipp Stockhammer, an archaeologist affiliated with the Max Planck Institute for the Science of Human History in Germany who specializes in organic residue analysis. "It has been used a lot for Stone Age stone tools, but hardly for later periods, and Tamar shows the unique potential this method can have."

At that level of analysis, it's possible to tell the difference between wild-caught and farm-raised ostrich eggs. Farmed ostriches lay eggs that tend to be smooth, while wild eggs, on the other hand, have microscopic ridges, which Hodos believes are indicators of environmental stress.

Hodos's study suggests that the ancient decorated eggs were sourced from the wild, which meant that they would have commanded a higher price than if they had been farmed. All of this suggests a vast supply and production line—chaine operatoire, to use a term of art—that fed the luxury market.

"You've got some schmuck who's being sent to go track the ostriches to begin with, and has to then try to steal eggs from a vicious beast that will kill you with a single kick or a peck of it's really sharp, nasty beak, and then bring them back, blow them [to remove their contents with the shell mostly intact], and then you have to let them dry out for an extended period of time before your artist can start crafting them," Hodos says.

After that, she adds, there's the challenge of perhaps fitting the eggs with metal accoutrements, sending them to port, transporting them across the sea, selling them to another merchant, and having that final seller convince a noble, probably speaking another language, to part with their own wealth in exchange.

"This is a shared understanding of bling, of what it means to be rich," Hodos says. "It's a really complex chain of operations in this luxury production industry."

In a modern era in which we can have digital house parties with 20 friends scattered across the globe, it can be hard to imagine that the ancient, internet-less world was all that "connected." Though it might have taken a little longer to make its connections, the ancient Mediterranean region was just that—a network of cultures and civilizations exchanging ideas and, evidently, eggs.

"We must not underestimate the connectedness in the past," Stockhammer says. "For me, the second millennium BC Eastern Mediterranean was a globalized world."

Please visit the site: https://www.atlasobscura.com/articles/ancient-ostrich-egg-trade [See also https://www.smithsonianmag.com/smart-news/fancy-decorated-eggs-have-been-traded-worldwide-thousands-years-180974639/] [Go there for pix]

ANIMALS IN ANCIENT NEAR EASTERN ART

The art of the ancient Near East includes some of the most vivid images of animals to be found anywhere. Interactions with animals shaped the world of the ancient people of the Near East: they shepherded flocks, guarded against dangerous wild animals, traveled long distances with the help of pack animals, hunted for subsistence and for sport, rode horses into battle, and marveled at powerful beasts and exotic creatures from distant lands. Images of animals took many forms, including painted pottery and clay sculptures, carved stone, and sculpture in precious metal. These images frequently appeared within compositions that evoked divinity, kingship, and the fertility of the natural world.

From the earliest times, animals were represented in the art of the ancient Near East (1984.175.13; 1984.175.15). Sculptures from the Uruk period show that artists were carefully attuned to the anatomy of domesticated and wild animals (1981.53). During the late fourth to early third millennium B.C. in Elam (southwestern Iran), craftspeople created remarkable depictions of animals behaving like humans—a theme that may have related to early myths or fables, now lost (66.173).

Both naturalistic and abstracted animal portrayals are found throughout the history of the ancient Near East (1978.58), and the selection of a stylized or exaggerated form is best understood as the craftperson's wish to emphasize a particular desirable or representative quality of the animal (59.52).

Wild Animals

Interest in wild animals, and particularly in features like horns, wings, and claws that were considered especially dangerous or powerful (47.100.88; 17.190.2055), is characteristic of ancient Near Eastern art of all periods, dating back at least to the Neolithic period. At the site of Göbekli Tepe, stone pillars were carved in relief with images of animals such as vultures and foxes, while at Çatal Höyük, plaster installations of animal teeth and horns and wall paintings of animals, including one of an enormous bull, were found in domestic spaces.

Contrary to what we might expect of the peoples who first domesticated many animals and plants, it is not the inner controlled and domesticated world that they chose to represent but the outer, wild world. During the Uruk period, the lion and bull became especially prominent in the art of the ancient Near East and first began to be used in images expressing the power of rulers. Images of lions were also used in protective contexts, and were set up in pairs to guard passageways into royal and ritual spaces (31.13.1; 31.13.2; 48.180).

Conflict between two or more powerful creatures is a recurring theme in ancient Near Eastern art (17.190.1672). Fierce animals shown locked in combat were perhaps meant to embody strong opposing forces in nature.

Domesticated Animals

Many animals, including dogs, sheep, goats, donkeys, pigs, and cats, were first domesticated in the Near East. (In contrast to modern perceptions about the Middle East,

camels were not common in the ancient Near East until the first centuries A.D., when camel caravans traveled the long-distance

trade routes that were the forerunners of the Silk Road.) Amulets and foundation deposits show that images of domestic animals could be thought to have protective functions. Portrayals of domesticated animals were also used to communicate ideas about fertility and to enhance ritual activities.

The horse was an animal of paramount importance. Memory of the mountainous origins of horses is reflected by references to these animals in Mesopotamian texts of the third millennium B.C. as the "donkeys of the mountains." After 2000 B.C., horses entered the Near East in large numbers, most likely from areas to the east and north. Horses became the premier animal of transportation and warfare, as well as symbols of royalty (1976.5). A defining moment in the history of the horse came with the invention of the war chariot in the seventeenth century B.C. The war chariot conferred an enormous advantage in the primarily infantry-based warfare of the ancient world. It is clear from the Amarna Letters that horses and chariots were among the most prized commodities in the elaborate system of royal gift exchange among the great powers of the late Bronze Age.

Fertility and Abundance

Animal imagery was used to express the importance of reproduction and the fertility of the natural world. Animals are shown either nursing their young or feeding from vigorously sprouting plants. Pairs of male and female animals allude to fertility through sexual reproduction.

Depictions of particular animals appearing to infinitely repeat on bowls or cylinder seals may have been meant to evoke the desire for abundance and agricultural productivity (50.218).

Animals and the Divine

Ritual observance, whether in the mode of a sacrifice, a ceremonial hunt, or in the decoration of sacred objects, was deeply connected with the animal world. Animals common to the diet of ancient Near Eastern peoples were sacrificed to the gods as daily meals.

Exquisitely crafted temple equipment often included images of animals.

Luxurious vessels in ceramic, stone, or metal in the form of animals or animal heads that often took the form of rhytons were especially favored as gifts for the gods (1979.447; 54.3.3). According to texts from the Hittite capital dating to the mid-second millennium B.C., these vessels were used by elite worshippers in rituals (1989.281.10).

Fierce animals, such as bulls and lions, as well as hawks, stags, and other powerful beasts, could be linked with certain gods whose qualities they shared (49.71.2): the storm god Adad was linked to the bull in part because of the similarity between the rumble of thunder and the roar of a mighty bull. Horned headdresses were markers of divinity in the ancient Near East (a greater number of horns corresponded to a higher status in the world of the gods). However, the gods of the ancient Near East did not commonly appear with

animal features. Occasionally, gods appeared with wings and other birdlike elements, but they remained recognizably human. Thus a depiction of a bull, for example, would be understood to refer to the storm god's presence and powers, rather than to represent the god himself in animal form.

Animals as Expressions of Power

Animal imagery was regularly used to express authority. Imitation through adornment or rhetoric allowed the power of an animal to be appropriated. Animal masks or skins may have facilitated spiritual ascent and may have been thought to enhance a hero or demon's power (2007.280). Metaphors for kingship often relied upon the animal world.

Kings described themselves as lions, having taken on the mantle of the animal's power by defeating it in combat. The Neo-Assyrian king Ashurnasirpal, in his Standard Inscription, refers to himself as ekdu, "fierce," a word that is often used to describe the might of strong bulls. By contrast, the subjects of a ruler were often imagined as domesticated flocks, with kings referring to themselves as shepherds.

Control of the natural world, as expressed by fierce animals, was a key aspect of the iconography of kingship. Hunting was one way in which control over the natural world was demonstrated (41.160.192). The royal hunt, in which the king could appear alone, mounted, or in a horse- or donkey-drawn chariot while shooting swiftly running animals with arrows, defined the ruler's attributes of strength, skill, and mastery of the natural world (43.135.2). Lion hunts were specifically restricted to royalty, and the motif of the lion hunt is among the earliest imagery affiliated with leadership.

Even into the Sasanian period, the royal hunt motif was maintained (1994.402). Rulers could also demonstrate the vast reach of their domains by collecting rare and exotic animals from distant lands.

According to cuneiform texts, Assyrian kings set up royal parks, similar to private zoos. Here they not only gathered elephants, lions, apes, and other animals but also planted lush gardens with non-native flora such as grapevines and date palms. Territories subject to Assyrian rule were required to offer the riches of their lands, including both animal products and the living creatures themselves, to the Assyrian kings as tribute (60.145.11).

Ivory became increasingly popular during the second half of the second millennium B.C., and large quantities of ivory sculpture were found in the Neo-Assyrian palaces. Although the collection and representation of wild animals in the first millennium B.C. served different purposes than the early Neolithic installations, the essential role of animals in efforts to grasp, control, and represent the earthly and supernatural worlds speaks to the power of animal imagery in the ancient Near East.

Please visit the site: https://www.metmuseum.org/toah/hd/anan/hd_anan.htm [Go there for pix and embedded linx]

THE HIDDEN HISTORY OF AEGEAN BOATBUILDING, BY CHRISSY PARTHENI

The Antiquities department at World Museum owns one of the rarest examples of boat models in the world. It helps reveal a fascinating history about a culture that depended on the sea.

Travel, maritime trade and exchange are common themes across National Museums Liverpool collections and important to Liverpool's history and development. How people travelled at different times, the technologies they used and developed are also fascinating subjects to explore, especially when that travel is from the Neolithic times in prehistoric Greece.

Panos Tzovaras, a PhD student at the University of Southampton came to study the small model of a boat (55.66.180) (image above) in the Antiquities collections of World Museum. It is only one of the four unique lead boat models that exist to tell the story of the travel of the Neolithic-Early Bronze Age people from the Aegean Sea in Greece, thousands of years ago.

The Aegean Sea is a popular summer holiday destination with its thousands of islands. In early Greek prehistory the people of these islands had maritime trade relations and exchanges across the Mediterranean basin.

The islands were the steppingstones that connect the European and Asian continents, the 'Golden Apple of Discord' during the prehistoric and historic times. The Cycladic cultures (named after the Greek word for circle because the islands are arranged almost in a circle)) from the Neolithic and early prehistory of the Aegean are less explored and understood.

Current archaeological evidence suggests that people were able to travel around that time if not earlier. By studying the distribution of obsidian, (a naturally occurring volcanic glass used in prehistoric tools) and of the Spondylus gaederopus mollusc, (the shell used for making exchanging goods in Neolithic times) in the island of Melos, archaeologists can confirm maritime interactions and inter/intra-networks during the Mesolithic era (ca.12000/10000-6500BC).

For the Aegean cultures, the sea acted as a connecting bridge. The people of the Aegean developed quite a sophisticated boatbuilding tradition. Understandably, there are no surviving examples of boats from that era and as such any representations of such boats are our only clue. At the sites of Strofilas in Andros and Vathy in Astypalaia, there are hundreds of rock-art depictions of various boat types.

Panos tries to understand the scale of the boatbuilding tradition during the Neolithic and Early Bronze Age (EBA) in an interdisciplinary way. He uses novel digital methods to classify the boat types and digitally reconstructs them. He will also test their seafaring properties in simulated conditions. During his visit in Liverpool Panos used photogrammetry to produce a 3D model of the boat.

By using the photographic technique of Reflectance Transformation Imaging, Panos revealed qualities, details of the boat and even tool marks that could not be easily discerned by the eye.

We do not know the specific site or excavation the boat model came from and some scholars thought it was a forgery. However, Panos's research shows that the boat shares the same features to a group of objects from the cist-grave in Naxos; some of the objects were marble figurines, dating to the Early Cycladic I or II periods (3200/3000-2300BC). Analysis of the metal used for the boat also indicated the source as the island of Siphnos.

Please visit the site: https://www.liverpoolmuseums.org.uk/stories/hidden-history-of-aegean-boatbuilding?fbclid=IwAR3o4_rV4vTGUEXeAqz_7gRPzEOMzvX5-wy8wHCVbQ4oLVtAQ-L2EAxb7CI

ANCIENT EGYPTIAN COFFINS AND MYSTERY OF 'BLACK GOO', BY KATE FULCHER

Several ancient Egyptian coffins and mummy cases have been found covered in a mysterious 'black goo'. Dr Kate Fulcher, Research Assistant in the Museum's Department of Scientific Research, explores what is this goo is made from, why it may have been used and what it can reveal about Egyptian funerary practice.

Djedkhonsiu-ef-ankh lived and died almost 3,000 years ago in ancient Egypt. We don't know a lot about Djedkhonsiu-ef-ankh's life, but we do know he was a priest in the temple of Amun at Karnak. Here he had two main roles – one was 'Opener of the Doors of Heaven', which meant he was one of the priests who was entitled to open the doors of the shrine in the temple sanctuary, containing the cult image of the god.

After Djedkhonsiu-ef-ankh died, he was mummified, wrapped in fine linen and sewn into his plaster and linen mummy case. This case was beautifully painted in bright colours and gilded with gold leaf over the face. At the time of his funeral, he was lowered into his coffin, and carried to his tomb. Then several litres of warm black 'goo' were poured all over the mummy case, covering it completely, effectively cementing the case into the coffin. The lid was then placed on the coffin, and he was left to journey forth to the underworld.

Djedkhonsiu-ef-ankh was not unique. Though not used by everyone – there are a number of instances of this 'black goo' being used in Egyptian burials. But what is it? And if we find out what it was made from, can we learn more about why the Egyptians used it?

There are many texts that deal with spiritual preparations for death in ancient Egypt, but very few texts that deal with practical aspects.

Knowledge about the practices around mummification and burial appear to have been restricted. So one of the best ways to learn more about this black goo is to chemically analyse it to find out what it is. We can do this in our science labs hidden underground the museum.

What is 'black goo'?

British Museum experts have analysed more than 100 samples of black goo from twelve coffins and mummy cases, all dating to the 22nd Dynasty in the Third Intermediate Period (c. 900–750 BC). To do this, we take tiny samples and conduct a form of chemical analysis called 'Gas Chromatography – Mass Spectrometry (GC-MS)'. This involves vaporising each sample and pushing it through a long tube, which separates the molecules in the sample. At the end of the tube, the molecules go into a mass spectrometer which separates them according to their mass to charge ratio. From this we can tell which molecules are present and in what quantities.

Analysis of black goo samples in laboratories at the British Museum.

We discovered that the goo is made of a combination of plant oil, animal fat, tree resin, beeswax and bitumen – which is solid crude oil. The exact ingredients vary from one coffin to the next, but the goo was always made from some of these ingredients. It is possible there were other ingredients as well, that we can no longer detect, because they were volatile and evaporated, or have degraded to undetectable levels over the 3,000 years since the goo was applied.

Where did the ingredients come from and how were they sourced?

Some of the products we have identified only naturally occur outside of Egypt, indicating that these were imported. The two tree resins we often find in black goo are pistacia tree resin and conifer tree resin. Tree resin is a liquid that trees produce in response to injury, which hardens to a brittle solid.

Pistacia trees grow around the Mediterranean, from Greece to Western Asia. Amphorae (pots) that contained resin from pistacia trees have been found at Amarna, the Egyptian royal city from 1347 to 1332 BC, and in the Uluburun shipwreck (off the coast of west Turkey) from approximately the same date. Analysis of the ceramics shows that these pots were most likely made in the region around Haifa in modern Israel, which is probably also where the resin was collected. Pistacia resin was also used as incense in ancient Egypt, and as a golden varnish on painted coffins, so we know it was being imported in reasonable quantities.

Conifer resin may come from a variety of trees, including pine, cedar, fir and juniper, but it's difficult to distinguish between these resins after so many years. The furthest south that these types of tree grow is Lebanon, which indicates that this resin was also imported into Egypt from somewhere further north. Conifer resin has also been found in jars relating to other ritual or funerary uses, again suggesting it was a common import.

Bitumen is an umbrella term for crude oil products. There are many sources known to have been used in ancient times, some liquid and some solid. Bitumen is made from living things (like plants, animals and single-celled organisms) that have died and been compressed over millions of years. Because these living things vary due to the local environment, bitumen also varies from place to place.

Examining the remains of these livings things, which we call 'biomarkers', is the key to finding out the source of the bitumen. By comparing the biomarkers in the goo sample to those from known sources, we can see that the bitumen came from the Dead Sea. This makes sense as ancient Greek texts refer to solid blocks of bitumen floating to the surface of the Dead Sea and people rowing out to these to hack pieces off and sell them in Egypt.

What was it used for and why?

We can't say for certain but, significantly, previous analyses of mummification balm (used on the bodies themselves) have shown it to be made of the same ingredients as the black goo that we have been studying on the outside of coffins and mummy cases. This means the black goo was being used at different points in the burial process – during the preparation of the dead body, and then again during the funeral, on top of the mummy case or coffin.

When someone died, they were said to become a form of the god Osiris, who is associated with death and rebirth. Osiris was called 'the black one' in various funerary texts and is often depicted with black skin and in the guise of a mummified body. Black is also the colour associated with the alluvial silt deposited on the banks of the River Nile after the annual flood receded. Since this fresh and fertile soil provided the ideal environment in which seeds for crops could germinate and grow, it was viewed it as being inherently magical and regenerative. Clay and wooden seed beds in the shape of Osiris, filled with black soil from the Nile and sown with germinating seeds, were sometimes included with the funerary equipment in New Kingdom burials.

So, we have interlinking concepts of black, Osiris, and regeneration.

It could therefore be reasoned that the practice of coating coffins in black goo links the coffins to regeneration associated with Osiris.

In addition to mummy cases, black goo was also painted on funerary statues of deities. There are several examples of this in the British Museum from the tombs of New Kingdom kings from about 1300 BC, including the seated figure pictured below. Many statues from the tomb of Tutankhamun were also covered in black goo, although these examples have not been analysed. Some shabti boxes (boxes used for holding figurines to be left in the tomb of the deceased) were also coated in black goo. So, it appears that the goo was a ritually important anointing fluid used for a range of purposes, all relating to the burial of the deceased and their transformation into Osiris.

But not everyone got the goo treatment. Evidence suggests that it was likely to have been reserved for social elites. Some of the earliest examples are from royal burials. Tutankhamun's innermost gold coffin was cemented into the middle coffin with 'bucketfulls' of black goo (since cleaned off). The black goo was also available to non-royals but the family had to be able to afford the treatment. Even among social elites, not everyone had black goo, and it seems to have been a matter of personal choice. Examples of the use of black goo are more common in the Third Intermediate Period (c. 1069 BC–c. 664 BC), which may be related to changes in funerary practices, or because more coffins are preserved from this time.

Recent excavations at the ancient town of Amara West, conducted by the British Museum in collaboration with the National Corporation for Antiquities and Museums (NCAM) in Sudan, have uncovered a crumbly black substance in a tomb dating to the end of the New Kingdom c. 1100 BC. Analysis of this black substance found that it contained oil, wax, pistacia resin, and bitumen, which means that this is an example of black goo. Amara West is in Nubia, an area to the south of Egypt that the Egyptians sought to control because of its gold deposits. This is the first example of black goo being found in Nubia and shows Egyptian funerary rites being used far away from the centre of power in Egypt.

There is more to be discovered! Most of the research so far has been into later examples of black goo, we hope that looking at examples from earlier times will tell us how the ingredients changed over time.
We also hope to make some of the black goo ourselves to enable us to think more about how it was stored, transported and poured, what it smelt like, and how hot it had to be.

This will help us to reimagine what a funeral might have been like in ancient Egyptian times.

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The Department of Scientific Research and Dr Kate Fulcher's work are supported by the Wellcome Trust.

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Please visit the site: https://blog.britishmuseum.org/ancient-egyptian-coffins-and-mystery-of-black-goo/

WHEN CADAVER DOGS PICK UP A SCENT, ARCHAEOLOGISTS FIND WHERE TO DIG, BY CAT WARREN

Recent research highlights the power of the canine nose to uncover buried remains from ancient human history.

On a sunny summer day in Croatia several years ago, an archaeologist and two dog handlers watched as two dogs, one after another, slowly worked their way across the rocky top of a wind-scoured ridge overlooking the Adriatic Sea.

Bodies had lain in beehive-shape tombs on this necropolis, part of the prehistoric hill fort of Drvišica, since the Iron Age. The two dogs, trained to detect human remains, were searching for scents that were thousands of years old.

Panda, a Belgian Malinois with a "sensitive nose," according to her handler, Andrea Pintar, had begun exploring the circular leftovers of a tomb when she suddenly froze, her nose pointed toward a stone burial chest. This was her signal that she had located the scent of human remains.

Ms. Pintar said the hair on her arms rose. "I was skeptical, and I was like, 'She is kidding me,'" she recalled thinking about her dog that day.

Archaeologists had found fragments of human bone and teeth in the chest, but these had been removed months earlier for analysis and radiocarbon dating. All that was left was a bit of dirt, the stone slabs of the tomb and the cracked limestone of the ridge.

Human-remains detection dogs, or cadaver dogs, are used worldwide on land and water. Well-trained dogs help find the missing and dead in disasters, accidents, murders and suicides. But the experiment in Croatia marked the start of one of the most careful inquiries yet carried out of an unusual archaeological method. If such dogs could successfully locate the burial sites of mass executions, dating from World War II through the conflicts in the Balkans in the 1990s, might they be effective in helping archaeologists find truly ancient burials?

On the scent of new tombs

Panda wasn't kidding. Neither was Mali, the other Belgian Malinois trained by Ms. Pintar and her husband, Christian Nikolić. Each dog gave her final indications that day by either sitting or lying inside the flattened circle of the tombs, their noses pointing toward the burial chests within. In some cases they leapt into the small burial chests before offering an alert.

The dogs' archaeological expedition had been initiated by Vedrana Glavaš, an archaeologist at Croatia's University of Zadar. She already knew a great deal about the necropolis at Drvišica, having fully excavated and analyzed the contents of three tombs there. Inside each were rough limestone burial chests. She and her team recovered amber

beads, belt buckles, bronze pins, teeth and phalanges. Each chest once held at least two bodies, which radiocarbon dating confirmed were 2,700 years old. The skeletal material was highly fragmented, however, and is still being analyzed.

But were there other tombs on the site, and could the dogs help locate them?

After that first preliminary search and its surprising result, Dr. Glavaš had beers at a local pub with the dogs' handlers. They decided to hold off any discussion for a few weeks.

"We needed to think a little bit about what just happened," Dr. Glavaš said.

A burial chest containing the remains of at least four children, along with some burial objects, found by two dogs during a double-blind search.Credit...Vedrana Glavaš

That "test run" was the beginning of a careful study on whether human-remains detection dogs could be an asset to archaeologists.

Setting up a controlled study was difficult. Dr. Glavaš had to learn the scientific literature, such as scent theory, far outside the standard confines of archaeology; the same was true for Ms. Pintar and the field of archaeology.

The training challenges were also difficult. Ancient human remains probably present a different and fainter scent profile than more recently deceased cadavers, especially as decades turn into centuries and then millenniums. False negatives seemed likely to occur.

"I think dogs are really capable of this, but I think it's a logistical challenge," said Adee Schoon, a scent-detection-animal expert from the Netherlands who was not involved in the study. "It's not something you can replicate again and again. It's hard to train."

And, as Dr. Schoon noted, dogs are "great anomaly detectors."

Something as subtle as recently disturbed soil can elicit a false alert from a dog that is not rigorously trained.

Nonetheless, the team returned to the necropolis for the first controlled tests in September 2015, and again a full year later. Both times, they used all four of Ms. Pintar and Mr. Nikolić's cadaver dogs: Panda, Mali, a third Belgian Malinois and a German shepherd.

They worked them on both known and double-blind searches, in areas where nobody knew if tombs were located.

The dogs located four tombs new to the archaeologists. Dr. Glavaš had suspected that a fifth site might hold a burial chest, and the dogs' alerts, combined with excavation, proved her suspicion correct.

In September 2019, the Journal of Archaeological Method and Theory published the results of their study: "This research has demonstrated that HRD dogs are able to detect very small amounts of specific human decomposition odor as well as to indicate to considerably older burials than previously assumed," Dr. Glavaš and Ms. Pintar wrote.

Dr. Schoon, who researches and helps create protocols to train scent-detection animals worldwide, said the Iron Age necropolis study was nicely designed and "really controlled."

Archaeological cold cases

Panda and Mali aren't the only dogs in the world that have helped locate human archaeological remains. In the United States, human remains detection dogs have aided discoveries at a variety of Native American sites, some badly damaged by looters and earlier generations of archaeologists with less ethical approaches to excavation, as well as by development and agriculture.

Paul Martin, a dog handler and trainer in Tennessee who is finishing his doctorate in earth sciences and geoarchaeology at the University of Memphis, has studied using dogs to find older remains for nearly two decades, demonstrating their capabilities at some of the large earthen mounds across the eastern United States that were once surrounded by flourishing Native American cities and villages.

His curiosity was piqued in 2002. Mr. Martin and his trained search dog were helping look for a murder victim in a Mississippi county where an informant said the victim was buried on "an old Indian mound." The dog started showing intense interest at the mound, and Mr. Martin suspected that it wasn't the more recent murder that held the dog's attention.

He spoke with John Sullivan, then a state archaeologist at Winterville Mounds near Greenville, Miss. Mr. Sullivan was curious, too: "Paul asked me if dogs would pick up old stuff and I said, 'Only one way to find out.'"

Mr. Martin started inviting experienced cadaver dogs and handlers to train on and near intact mounds. For years, they recorded dogs' alerts on mounds in two areas of Mississippi, and even in fields nearby, where earlier mounds were probably flattened.

But getting funding and permission to do excavations is difficult. The alerts remained unconfirmed. Nonetheless, nature sometimes kicks out some free clues. That's what happened on Mound H in Winterville, Miss., in 2006.

Rodents provided "ground-truthing," or confirming evidence, free of charge by digging new burrows and displacing what had been hidden for centuries. Just downhill from where a number of human remains detection dogs had alerted during earlier training, "we actually saw a trail of bone coming down the side of the mound," Mr. Martin said.

A forensic anthropologist confirmed the bones were human, including a child's scapula. Mr. Sullivan believes they come from the last burials at the site, and date to around 1450 A.D.

Cadaver dogs are also helping archaeologists at some especially challenging sites. Mike Russo and Jeff Shanks, archaeologists with the National Park Service's Southeast Archeological Center, had created at least 14 test holes near a promising site in northwest Florida that had been flattened during an earlier era of less diligent archaeology.

They found nothing.

“We knew where it should be, but when we went there, there was absolutely no mound,” Mr. Russo said.

They then asked Suzi Goodhope, a longtime cadaver-dog handler in Florida, to bring her experienced detection dog, Shiraz, a Belgian Malinois, to the site in 2013. Shiraz and Ms. Goodhope worked the flat, brushy area for a long time. Then, Shiraz sat. Once.

“I was pretty skeptical,” Mr. Shanks said.
Nonetheless, the archaeologists dug. And dug. They went down nearly three feet — and there they found a human toe bone more than 1,300 years old

Passing sniff tests

What is the future of using human-remains detection dogs as a noninvasive tool in archaeology?

Some archaeologists, forensic anthropologists, geologists, scientists — and even H.R.D. dog handlers who know how challenging the work is — say they have great potential. But challenges abound.

Although researchers are learning ever more about the canine olfactory system, they are still trying to pinpoint what volatile organic compounds in human remains are significant to trained dogs.

It’s also unclear what concentration of human remains a trained dog can detect, and which aspects of a given environment help retain the scent.

Ms. Pintar and Dr. Glavaš speculate that at the site in Croatia used in their study, the porous and cracked limestone on the ridge might play a role in the longevity of the scent there. Perhaps the mountain itself — used as the base of each burial chest — held on to the scent for thousands of years. But more research will need to be completed to confirm these findings.

Detection dogs also must be trained for archaeology with more consistency. Often humans are the limiting factor. Sometimes, Dr. Schoon said, she can almost see a dog thinking, “Is that all you want me to do? I can do much more!”

And dogs are only a complement to more standard archaeological tools, Mr. Martin noted. The best results come when good human-remains detection dog teams are combined with ground-penetrating radar, geophysical surveys and historical information, and — when feasible or desirable — confirmed with soil tests or excavation.

But more archaeologists around the world are taking note of detection dogs’ potential. Ms. Goodhope has continued working with park service archaeologists on lost slave cemeteries, Civil War sites and other early Native American sites. And Mr. Sullivan, now with the federal Bureau of Land Management, continues to work with dogs and handlers to locate, and avoid the destruction of, Native American sites.

Since Ms. Pintar and Dr. Glavaš's Croatia study was published last year, several European and Croatian archaeologists have asked them for help in identifying sites, too.

As for the Iron Age necropolis high on the rocky ridge at Drvišica?
Dr. Glavaš said she doesn't intend to return to excavate there.

"Something has to be left for future archaeologists."

Please visit the site: https://www.nytimes.com/2020/05/19/science/cadaver-dogs-archaeology.html [Go there for pix]

PERFECTLY PRESERVED ANCIENT ROMAN MOSAIC FLOOR DISCOVERED IN ITALY, BY ROB PICHETA

A beautiful and remarkably well preserved mosaic floor from ancient Rome has been discovered by archaeologists in northern Italy.

The stunning discovery, made in the township of Negrar, north of Verona, comes almost a century after the remains of an ancient villa were found on the site.

5,000-year-old sword is discovered by an archaeology student at a Venetian monastery Pictures of the floor posted by the town's officials show its intricate patterns and colorful detail, much of which has been preserved perfectly through centuries.

The floor was buried underneath a vineyard in the hilly region, officials said.

Some Mount Vesuvius victims suffered slowly and one victim's brain turned to glass, new research says

They wrote that "after countless decades of failed attempts," archaeologists had uncovered "part of the flooring and foundations of the Roman Villa located north of the capital, discovered by scholars over a century ago."

The team's objective was to "identify the exact extension and exact location of the ancient construction," they added in the statement online.

The town will now work to ensure the floor can be seen by the public, officials said, but they warmed: "The result will not come soon and significant resources will be needed."

Ancient sites in Italy are starting to slowly reopen as the country comes out of its lengthy coronavirus lockdown.

Shortly before the pandemic hit Italy and forced nationwide closures, the famed House of Lovers in Pompeii was reopened after 40 years following an ambitious restoration project.

Please visit the site: https://www.cnn.com/style/article/negrar-mosaic-floor-italy-discovery-scli-intl/index.html [Go there for pix]

EAR INFECTION PLAGUED PEOPLE IN ISRAEL 15,000 YEARS AGO, STUDY FINDS, BY ROSSELLA TERCATIN

Once an extremely dangerous illness, ear infections have been plaguing humanity for at least fifteen millennia: A group of Tel Aviv University researchers found that the inhabitants of ancient Israel suffered from it already 15,000 years ago.

Ear infections can be studied in a precise way because they leave very specific signs in the middle ear which can only be caused by it, Dr. Hila May of the Department of Anatomy and Anthropology at TAU's Sackler Faculty of Medicine and the Dan David Center for Human Evolution and Biohistory Research explained to The Jerusalem Post.

"However, in the past in order to examine the middle ear in a skull, the skull had to be opened and therefore damaged. New technologies that we have in our labs have allowed us to overcome the challenge," May, who is the lead author of a study recently published in The International Journal of Osteoarchaeology, further pointed out. Other authors of the paper include Katarina Floreanova, Efrat Gilat and Ilan Koren.

The scholars employed a videoscope featuring a flexible tube equipped with a micro-camera at the end to explore the ear canal and the middle ear. Moreover, the skull remains were scanned with a high-resolution micro-CT.

The group examined over 220 skulls from a local population dating from six different periods between 15,000 to 2,000 years ago.

They found out that the frequency of the illness declined as the population's lifestyle transitioned from hunter-gathering to sedentary: among the hunter-gathers, the morbidity was about 70%, which declined to 60% among early farmers. However, a new peak was registered around 6,000 years ago, increasing the percentage of specimens presenting signs of ear infections to 80%. Then once more the infection rate decreased and it stabilized at around 50%, the same where it stands today.

If the more stable life initially allowed those ancient populations to be less affected by infections, some factors, including a decrease in temperatures and an increase in rainfall, but also the poor living conditions, with men and animals crammed together in small spaces, probably caused the illness to increase. When the conditions improved again, the morbidity went down.

All the skulls came from excavations conducted in Israel.

"Studying samples from Israel presented the advantage that all those ancient individuals lived under similar conditions since we are speaking about a small region, even though the climate conditions changed over the time with the Chalcolithic period presenting a more rigid weather, which might have been part of the reason for a higher morbidity at that time," the researcher said.

May pointed out that all the examined skulls were from adults, but that the marks left by the infection in the middle ear would have not disappeared even if the individual had developed the illness as a young child, as it is common to this day, although thanks to the discovery of antibiotics, the consequences are way less severe.
"Learning about diseases' history and how they behaved in the past helps us understand how diseases develop, appear or disappear," she concluded. "An ear infection is something that we have suffered from since forever because of our anatomy. Understanding how ancient populations lived with it and what factors were the most influential is relevant to this day."

Please visit the site: https://www.jpost.com/health-science/ear-infection-plagued-people-in-israel-15000-years-ago-study-finds-628702 [Go there for pix]

A CALENDAR IN STONE: HITTITE YAZILIKAYA, BY EBERHARD ZANGGER AND RITA GAUTSCHY

A great deal is known about the Hittite culture that ruled over central Asia Minor from around 1600 to 1190 BCE, only to suddenly collapse and be forgotten for over 3,000 years. The curiosity of the educated classes was instantly aroused when, in 1834 CE, a European scholar first saw the massive architectural remains of the Hittite temples in the former capital Hattuša, about 150 km east of Ankara in central Anatolia. Excavations commenced in 1906 and became so incredibly productive and insightful that they still continue today.

As many as 33,000 cuneiform documents and text fragments have been retrieved from the former palace. The 6.8-km-long fortification wall protected as many as 30 temples.

The Hittites proudly reported that they lived in the "Land of Thousand Gods," presumably to emphasize how divinely blessed they were.

However, with wealth comes responsibility, and the Hittite Great King, as the gods' chief representative on earth, was expected to participate in all the major festivals to honor them. Nurturing and pleasing the multitude of divinities also occupied a large proportion of the elites' time throughout the year. There were no less than 165 religious festivals across the country. A keen observer visiting the land of Hatti was thus quite likely to see a royal entourage forming a procession in a ceremonial venue in which a statue of a deity, sheeted with gold, was retrieved from a temple and carried across open land to one or more sacred places. But remembering when to hold those festivals was a challenge.

There is a wealth of Bronze Age documents, most dealing with prayers and festival liturgies, as well as many studies of Hittite religion, including sacred springs, grottos and caves, rocks and mountains. So far, however, little emphasis has been placed on identifying the Hittites' relation to celestial deities, even though their highest-ranking goddess was the Sun Goddess of Arinna, and the Great King of Hatti even used to refer to himself as "My Sun."

Probably the best depiction of the Hittite pantheon is preserved just outside the city walls of Hattuša in the rock sanctuary of Yazılıkaya, one of the most fascinating archaeological sites in the world and a World Heritage site.

For almost two centuries, scholars have been puzzled by the procession of over 90 deities and mythical figures carved into the vertical faces of the natural limestone outcrop. Its artistic style is completely distinct from the examples familiar from ancient Egypt and Mesopotamia. Without doubt, this place was of utmost importance in Hittite religion; but what exactly were priests and the royal family celebrating at this spot? The archaeologists in charge of excavations at the site have long argued that the highest echelons of Hittite society celebrated the beginning of the New Year at this sanctuary.

I (Zangger) first saw Yazılıkaya in the spring of 2014 during a vacation to visit archaeological sites in Turkey. The local hostel where I spent the night had sold me the "Hattusha Guide" written by the German prehistorian Jürgen Seeher, who was in charge of the excavations from 1994 to 2006 on behalf of the German Archaeological Institute. Seeher states on page 157 of the guide that a particularly large relief of the Hittite Great King Tuthalija IV lies in the shade throughout the year, except for a few days around the summer solstice, when it is illuminated by natural sunbeams.

Absent-mindedly I made a note in the margin: "calendar?". Little did I know that this spontaneous thought would keep me occupied for the next five years.

The rock sanctuary consists primarily of two chambers, for the most part natural, designated Chamber A and B. Chamber A has always been an open space, with dozens of reliefs carved into the limestone walls at eye level. Chamber B, on the other hand, contains a massive vertical face pointing almost due north. It looked so technical – the smooth face had even been extended with ashlar masonry in Hittite times – that I thought the rooms may indeed have had a technical function in addition to their religious and symbolic meaning. An astronomical application appeared to be a good place to start.

Upon returning to Zurich, I came into contact with Rita Gautschy, an archaeologist and archaeoastronomer at the University of Basel. We decided to jointly pursue an investigation of the sanctuary. Little by little we worked towards an interpretation of the groups of figures and the deities themselves, until we eventually understood how the whole system may have been used. In our view, it is a tool to operate a calendar based on celestial events. To make sure that their festivals fell in the right season, the Hittite priests had to keep track of the beginning of each year and month. This is what we think Yazılıkaya was used for – and could still be used for today, since the system works in perpetuity.

We distinguished four groups among the 63 preserved reliefs of deities in Chamber A, beginning with 12 identical male gods on the west wall at the entrance. These, in our view, were used to count the 12 lunar months of a year – an idea that had already been brought forward in 1973 by the ancient historian Friedrich Cornelius. Next, to the right, is a group of 30 deities, which we interpret as keeping track of the days of a lunar month (alternating between 29 and 30 days). Since a lunar year comprises 354 days (12 times 29.5), a leap month had to be inserted approximately every three years in order to keep the lunar calendar synchronized with the seasons.

We think that days and months were counted and marked from right to left, following the path of the moon across the sky. The Hittite priests most likely used wood or stone columns to indicate the current day and month. A carefully shaped sill, still well preserved, could have accommodated these markers.

The eastern wall nowadays shows 17 female deities, but originally there were at least nineteen. One of the two today missing figures is gone, with only a hieroglyph on the wall with its name indicating that it used to be there. The other missing figure was found in the neighborhood in 1945, and is now displayed in a nearby museum. If the group indeed consisted of 19 reliefs, it could have been used to mark a 19-year solar cycle. Such a 19-year solar cycle is a perfect tool to align solar and lunar calendars.

The symbolic role and possible technical function of the five deities in the main scene is not yet explained – we are planning to take up this task in due course. Chamber B, too, requires more scholarly scrutiny. Like Chamber A, it contains a group of 12 identical gods, which we interpret to indicate the lunar months. With the chamber pointing almost due north, the sharp natural rock edges could have been used as a star clock – a system that had been in use in Egypt for over a thousand years by the time Chamber B was created.

This new interpretation of Yazılıkaya serves as a starting point for a better understanding of Hittite religion. Celestial deities played a paramount role in the Hittite religion that acted as an amalgam of different local Anatolian beliefs and rites on one hand, and of concepts of stargazing that were for the most part adopted from principles first recognized in Mesopotamia.

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FEAST OF SNAILS AND PIG SHEDS LIFE ON HELLENIST LIFE IN ANCIENT GALILEE, BY ROSSELLA TERCATIN

"If we look at food remains in Jewish settlements from the same period, we see very different species," Pines, whose expertise is in the field of zoo-archaeology, told the Post.

The remains of a Hellenist banquet dating back to 2,200 years ago recently uncovered by a group of archaeologists from the Tel Aviv University (TAU) have helped to shed light on the everyday life of Greek settlers in the land of Israel before the Galilee was conquered by the Hasmonean Kingdom.

The pit was revealed during excavations at Tel Bet Yerah, headed by TAU Prof. Rafi Greenberg and Dr. Sarit Paz.

As explained to The Jerusalem Post by Miriam Pines, one of the authors of the article, published in the latest issue of the Journal of Eastern Mediterranean Archaeology & Heritage Studies, the project was conducted "within inter-discipline research aimed at discovering the small forgotten things of the past societies in this land."

"Hellenistic Philoteria was located in a region that was very important to the powers of the time in the context of the Second Syrian War between the Seleucid Empire and the Ptolemaic Kingdom of Egypt," Pines said.

Philoteria was a Hellenistic colony established by Ptolemy II, and was probably settled by veterans of Ptolemy's army and by local inhabitants of the region around 260 BCE, around the same time that the war broke. It was conquered by the Hasmonean Kingdom a little over a century later. According to the researchers in those decades the site's inhabitants live carrying on with their customs and culture, as the recently-discovered findings confirm.
"Most research about that time focuses on the major cities in the land of Israel, such as Jerusalem and Beit She'an," Pines said. "Philoteria represented a periphery and a context that has less to do with the relations between the Israelites and the Greeks and more with the latter and their culture."

"Moreover, it is rare to have the opportunity to investigate the domestic life conducted by normal people," she added.

The study focused on the remains from a single trash pit found outside a house of the village. The variety of its content suggests that the pit contained the remains of an individual feast or at most some small events, since all what was needed to prepare, serve and eat a meal was present: food residual, shards of pottery, tableware, a pot and charred firewood.

The types of food uncovered highlight the difference between the culinary preferences of the people consuming that meal and the Jewish dietary customs. Among the scraps were a large amount of snail shells both from saltwater and freshwater species, as well as pig

and gazelle bones, all of which are unconsidered unfit to eat by the laws of kashrut – Jewish dietary laws.

"If we look at food remains in Jewish settlements from the same period, we see very different species," Pines, whose expertise is in the field of zoo-archaeology, told the Post. Cattle, sheep and goat bones were also identified.

"Another thing we noticed was that we found parts of the animals that can be considered less valuable, and especially skulls, with more prime bones. This detail tells us that they ate these parts together and that we are looking at a rustic culture," she explained.
"Moreover, the fact that the bones are not charred means that they were not roasted directly on the fire, but rather cooked in some form of stew, which is consistent with the fact that we found the remains of a pot."

The results of the research are coherent with other findings related to the Hellenistic diet from the period revealed in sites in other countries around the Mediterranean.

"Unfortunately Philoteria presents very meager remains from the Hellenistic period and some have been damaged by dwellings built in the site in later periods," the archaeologist said.

Among the questions that so far remain unanswered is whether the settlement was inhabited only by Greeks or also by Jews, as occurred in other parts of the region.
Other authors of the article include Alol Dor, Prof. Daniella E. Bar-Yosef Maye and Prof. Oren Tal.

Please visit the site: https://www.jpost.com/israel-news/culture/feast-of-snails-and-pig-sheds-life-on-hellenist-life-in-ancient-galilee-628024