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- Αύγουστος 2021 -

**Every heart sings a song, incomplete, until
another heart whispers back. Those who wish to
sing always find a song. At the touch of a lover,
everyone becomes a poet.**
(Plato)

Newsletter of the Hellenic Society of Archaeometry

- August 2021 -

Nr. 245

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ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

THE POZNAN YOUNG RESEARCHERS’ CONFERENCE, NOVEMBER 17-19, 2021, COLLEGIUM HISTORICUM NOVUM, MORASKO UNIVERSITY CAMPUS, POZNAN, POLAND

Dear all,

Below I attach the call for papers of a conference for students and young researchers organized by my colleagues at the Adam Mickiewicz University in Poznan (Poland). Contributions about all regions and time periods are welcomed, thus I hope that some Aegean studies will find their way to the programme.

All the best,

Piotr Zeman
Doktorant
Wydział Archeologii
Uniwersytet im. Adama Mickiewicza

PhD candidate
Faculty of Archaeology
Adam Mickiewicz University

The Poznan Young Researchers’ Conference is organized for PhD students and Young Researchers. The event will be held *November 17-19, 2021* in Collegium Historicum Novum at Morasko university campus (Uniwersytetu Poznańskiego Street 7), in Poznan, Poland.

The deadline for submission is *August 15*, 2021.

You’re submitting to one of our four panels, which are:

- Heritage – this session invites papers reflecting on broadly understood cultural, archaeological, and historical heritage, its production, transmission, perception, recognition, interpretation, and management. We open up for an interdisciplinary discussion on theories and methods of tangible and intangible heritage preservation in different geographical and chronological contexts.
- Archaeological science – the session invites papers focused on widely understood interdisciplinary researches on environmental sciences, such as: paleoclimate researches, human - fauna - flora – bioarchaeological researches, production methods researches, dating techniques, and more.

- Landscape – this session invites papers on field prospecting methods, and methodological issues associated with human–space relation, such as Geographic Information Systems (GIS) based research, aerial archaeology, anthropopressure, remote sensing, settlement studies, etc.
- Finds and material studies – this session invites papers focusing on material and artifacts studies including case studies, research methodology, field studies and survey reports, experimental archaeology, Biography of Things discourses, etc.

Please submit via:

<https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdocs.google.com%2F...%2F1FAIpQLSd11MVtEyi...%2Fviewform&data=04%7C01%7Caegeanet%40lists.ku.edu%7Cb82e39fb1e3c4e569d2308d943bb866b%7C3c176536afe643f5b96636febbe3c1a%7C0%7C1%7C637615294957135478%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCI6Mn0%3D%7C3000&sdata=j%2Ft9eE8SQm3D7ZchwJVkKruZ%2BhgUY3a4uBvpFVJE5eU%3D&reserved=0...>

The conference registration fee is 70€ and it includes:

- lunches and coffee breaks during the conference,
 - integration event
 - conference materials
- You can find more information at:

pyrac.amu@gmail.com

<https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.facebook.com%2FPYRAConf&data=04%7C01%7Caegeanet%40lists.ku.edu%7Cb82e39fb1e3c4e569d2308d943bb866b%7C3c176536afe643f5b96636febbe3c1a%7C0%7C1%7C637615294957145472%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6IklhaWwiLCJXVCI6Mn0%3D%7C3000&sdata=xVnjCNo89y4PGXEBitBQp0ZOr3FAt1g2t3DYt2k3ffi%3D&reserved=0>

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THE 15TH INTERNATIONAL ACCELERATOR MASS SPECTROMETRY CONFERENCE - NOV 7-19 2021 [SEC=UNOFFICIAL]

Dear friends and colleagues,

I guess most of you have been asking, “well what’s happening with the 15th International Accelerator Mass Spectrometry Conference that was scheduled for September 2021 in Sydney, Australia?”

Well we have good news and bad news...

The good news first - the 15th International AMS Conference is on!! Yes, its happening from November 7th - 19th 2021.

And the bad news.. Unfortunately you will not be able to walk across the Sydney Harbour Bridge or swim in beautiful Bondi beach because AMS-15 will be an on-line virtual Conference.

We are planning an early-access week November 7-14 for you to view pre-recorded orals and posters, followed by a Conference week (Nov 15-19) of keynote and plenary talks, regular oral and poster sessions with live Q&A, then a 2 month period where all presentations are available for on-demand viewing.

We apologise for the long delay in announcing the dates for AMS-15 but with the ever-changing regulations and conditions here in Australia and around the world due to COVID-19, a number of new arrangements had to be made from our original plans. Our new website with all the information to complete registration and submit your abstracts, with a list of important dates, will go live on Friday July 16th.

Please check out our new website www.ams15sydney.com which opens on Friday 16th July 2021.

We look forward to your participation at AMS -15 and will be pleased to provide a platform for you to share your exciting and new AMS related research that you have done since the AMS-14 Conference in Ottawa in 2017.

All the best, stay healthy, happy, and safe.

Dr David Fink
Conference Chairperson, AMS-15,, 2021

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

**SHORT-TERM FELLOWSHIPS AT LA@UOP,
LABORATORY OF ARCHAEOLOGY AT
THE UNIVERSITY OF THE PELOPONNESE,
GREECE**

1st CALL WILL OPEN SOON!	
Positions available:	10 semiannual and 4 annual research grants
Submission deadline:	August 31, 2021
Notification of evaluation:	September 20, 2021
Completion of projects:	April 30, 2022 (semiannual grants) November 30, 2022 (annual grants)

ARISTEAS (Advancing Research Infrastructure & Scientific Techniques in Archaeological Science) is a NSRF funded project led by Professor Nikolaos Zacharias of the **Laboratory of Archaeology** at the University of the Peloponnese, Greece. The project aims at enhancing the infrastructure of the LA@UOP through the acquisition of equipment in three significant fields of Archaeological Sciences, namely: analysis of archaeomaterials, remote sensing and digital technologies.

An essential part of the successful implementation of ARISTEAS is the funding of young researchers for short-term research within the facilities of [LA@UOP](#), aiming to make full use of its infrastructure and focusing on the fields of Archaeology and Cultural Heritage.

Grant beneficiaries not only will be given **open access to all LA@UOP infrastructure** for the implementation of their research, but also will be provided with a **small stipend for the coverage of personal expenses**.

Beneficiaries are expected to work on the facilities of [LA@UOP](#) for an overall period of at least one month (two months for the annual grants). During the remaining time of their project, they are expected to complete the analysis and synthesis of their data and submit a report, which will be evaluated and approved by the Scientific Committee of ARISTEAS.

	Semiannual Grants	Annual Grants
Duration	6 months	12 months
Overall number of grants	20	4
Stipend	2.500 € (1.500 € at the beginning of the semester and 1.000 €	5.000 € (2.000 € at the beginning of each semester and 1.000 € after the successful

	after the successful submission of the Lab Report)	submission of the Lab Report)
Offered	- Access to all facilities of LA@UOP - Training on the use of equipment and software - Consultation on data analysis and synthesis	
Not included	- Accommodation cannot be provided within the University facilities - Cost for complex techniques for the preparation of samples (e.g. FIB), which are not available in the LA@UOP	
Deliverables	- Lab report summarizing the methodology, analytical results and main outcomes of the project	- Lab report summarizing the methodology, analytical results and main outcomes of the project. - The programme strongly encourages for a peer-review publication or the submission of an abstract at a relevant international symposium, based on the resulted analytical data.

Entry Requirements

ARISTEAS research grants are addressed to young researchers conducting research in Archaeological Sciences and more specifically in the fields of analysis of archaeomaterials, remote sensing and digital technologies.

- PhD candidates and Post-doc researchers in aforementioned fields are welcome to apply.
- Applicants will be evaluated based on the excellence of their research proposal (significance of the artefacts/sites under study, novelty of the suggested methodology, efficient and productive use of the LA@UOP infrastructure, clarity of the research question, feasibility of completion within the time restraints).
- Applicants must have acquired all necessary permits and/or samples prior to the application.
- Grant beneficiaries cannot apply for an extension of their grant or a second grant.

How to apply

For more info on how to apply please check: <http://aristeas.eu/how-to-apply>
 or contact us at aristeas@go.uop.gr

CONSERVATION POST CARDIFF **UNIVERSITY**

Cardiff University is seeking to appoint an additional member of staff to its Conservation Teaching team. We offer a range of undergraduate and Postgraduate degree schemes focussing on conservation of archaeological and heritage objects. I would be grateful if you could bring the advertisement for this post to the attention of anyone you consider may have an interest in applying for this post.

POST

1200BR Lecturer in Conservation
Cardiff School of History, Archaeology and Religion
Teaching and Scholarship

Cardiff University vacancies.

<https://www.cardiff.ac.uk/jobs/vacancies>

Advert and job description.

https://krb-sjobs.brassring.com/TGnewUI/Search/Home/HomeWithPreLoad?partnerid=30011&siteid=5460&PageType=searchResults&SearchType=linkquery&LinkID=6#jobDetails=1838539_5460

Thank you in advance for any help you can offer in disseminating this post within the heritage preservation sector.

David

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Research Projects

<http://www.cardiff.ac.uk/share/contactsandpeople/academicstaff/U-Z/watkinson-david-dr.html>



APPLY FOR A FELLOWSHIP AT THE ALBRIGHT INSTITUTE IN JERUSALEM FOR THE 2022-2023 ACADEMIC YEAR

DEADLINE TO APPLY: October 15, 2021

Visit www.aiar.org/fellowships for more information.

The Albright Institute in Jerusalem is the oldest American research center for Near Eastern studies in the Middle East. The Albright annually provides up to \$330,000 in fellowships and awards to 32 recipients. In addition, 32 Associate Fellows including Senior, Post-Doctoral, and Research Fellows receive funding from other sources.

Fellowships are open to students and scholars in Near Eastern studies from prehistory through the twenty-first century, including the fields of archaeology, anthropology, art history, biblical studies, epigraphy, historical geography, history, language, literature, philology, and religion. We also encourage applications from scholars and graduate students in related disciplines, including museum studies, cultural heritage, and preservation, pursuing projects that focus on contemporary engagement with the pre-modern past. Please see our recently revised mission statement [here](#).

Each year, Albright Fellows, primarily from the United States, Canada, Europe, China, Israel, and Palestine, exchange ideas with hundreds of other local and foreign researchers as well as with students and the public both in the US and locally. The Albright provides a wide range of programs and resources for doctoral and post-doctoral research.

Programming includes an annual series of lectures, workshops, symposia, field trips, and social events. Resources include an extensive research library, access to physical and digital resources both on campus and at neighboring institutions, laboratories, storage facilities, community spaces, and living accommodations.

All nationalities, and students and scholars at all levels, are eligible for at least some of our fellowships. Please note that any fellowships open to European citizens will continue to include those of the United Kingdom. The research period should be continuous, without frequent trips outside the country. Residence at the Albright is required. The option to accommodate dependents is subject to space available at the Albright. The Albright does not discriminate on the basis of sex, race, color, religion, national or ethnic origin, age, disability, sexual orientation, or gender identity or expression.

For a full list of available fellowships, requirements, and to apply <http://www.aiar.org/fellowships>

For further information please contact Dr. Jennifer Gates-Foster gatesfos@email.unc.edu
For technical issues with the application system: matthew.j.adams@aiar.org

**RESEARCH ASSISTANT: MATERIAL
ANALYSIS IN CONSERVATION SCIENCE
AND ART TECHNOLOGY RESEARCH AT
THE COLOGNE INSTITUTE FOR
CONSERVATION SCIENCES AT COLOGNE
UNIVERSITY**

Dear Colleagues,

The Cologne Institute for Conservation Sciences at the Cologne university of applied sciences, is looking for a research assistant with experience in FTIR and Raman spectroscopy.

Details can be found on our site: [Research assistant \(m/f/d\) for material analysis i...](#)

Ester S. B Ferreira

Ester Ferreira
Professor
Technische Hochschule Köln, Cologne Institute of Conservation Sciences
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ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

SURVEY ON 50 PRIORITY RESEARCH QUESTIONS FOR HERITAGE SCIENCE

Dear Colleague,

As part of the [IPERION-HS European consortium for Heritage Science](#) we are conducting a survey on the “50 priority research questions for Heritage Science”. This is preparation for a massively multi-authored paper on challenges in Heritage Science and the research data infrastructure needed to solve them. It is also part of the groundwork for the future DIGILAB data infrastructure for supporting [E-RIHS, the European Research Infrastructure for Heritage Science](#). We are currently seeking input on what the most important challenges are, and **all opinions are welcome from any field**.

In case you would like a definition of scope: “Heritage science is the interdisciplinary domain of the scientific study of heritage. Heritage science draws on diverse humanities, sciences and engineering disciplines. It focuses on enhancing the understanding, interpretation, sustainable care and use of heritage so it can enrich people's lives, both today and in the future. Heritage science is an umbrella term encompassing all forms of scientific enquiry into human works and the combined works of nature and humans, of value to people.” (https://en.wikipedia.org/wiki/Heritage_science)

The survey should take no more than 10-15 minutes to complete, **and all participants will be given the option of becoming a co-author on the paper**. More details are in the survey itself.

Please complete the survey by 15th September using this link: <https://forms.gle/rA1DQbShbwuGUdiG7>. You may fill in the survey more than once, especially if you have multiple positions or roles which lend different perspectives.

If you have any questions or comments, please contact Philip Buckland (philip.buckland@umu.se) or Francesca Pilotto (francesca.pilotto@umu.se). However, please do not hesitate to fill in the survey – all views are relevant.

Kind regards,

Philip Buckland & Francesca Pilotto

Dr. Philip Buckland
Senior Lecturer in Environmental Archaeology
Director of The Environmental Archaeology Lab.
Umeå University
SE-901 87 Umeå, Sweden

PROJECT “METAL PLACES: CULTURE CROSSROADS IN EASTERN MEDITERRANEAN”

It is with great pleasure that we announce the launch of the project “*METAL PLACES: Culture crossroads in eastern Mediterranean*”. The project focuses on the Cycladic islands of Sifnos, Serifos, Kythnos in Greece and the Community of Asgata in Cyprus, areas of outstanding cultural and technological heritage which possess ancient mining and metallurgical remains covering the last 5000 years, which have not received the recognition they deserve. The main goal is to promote this pan-European heritage based on the triptych “Culture-Tourism-Development”. The consortium consists of NCSR “Demokritos” (Lead Partner), the Ephorate of Antiquities of Cyclades (Hellenic Ministry of Culture and Sports), the Municipality of Sifnos, the Archaeological Research Unit of the University of Cyprus and the Community of Asgata.

“*METAL PLACES*” aims at protecting, enhancing, promoting as well as valorizing a common aspect of the cultural heritage of Greece and Cyprus, while at the same time it will contribute to the development of tourism and the enrichment of the tourist product, through cross-border cooperation and the adoption of shared “good practices” initiatives. The project adopts a multi-level approach, reconciling the different priorities set by the need for tourism development on one hand, and protection of cultural heritage of an area, on the other. The project is also directed at promoting the selected areas, using modern technologies (3D visualization, Web-GIS platform), new forms of communication (social media, mobile applications), involving also the co-participation of local stakeholders.

“*METAL PLACES*” has a duration of 24 months and is funded by the cooperation programme Interreg V-A «Greece-Cyprus» 2014-2020, with a total of € 1,301,400.00.

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

NEW DIRECTIONS IN THE STUDY OF ANCIENT GEOGRAPHY, BY DUANE ROLLER

BMCR 2021.07.09

Publications of the Association of Ancient Historians series.
University Park: Penn State University Press, 2020. Pp. xi, 208.
ISBN 9781734003116 \$99.95.

Review by Joel Gordon, University of Otago. joel.gordon@otago.ac.nz [Authors and titles are listed at the end of the review.]

The five essays contained within *New Directions in the Study of Ancient Geography* cover a broad span of material, with no two chapters addressing the same period, author, or literary genre. This breadth is a strength: as the editor states, the collection is intended to “demonstrate the great diversity of the discipline” (p. 4). This aim is certainly achieved. Yet, aside from sharing the titular theme of “new directions” and an emphasis on ancient geography, there is little continuity across the volume.

The volume’s introduction—as brief as it is (totalling three and a half pages)—provides a clear and concise framework for thinking about “ancient geography”. This conceptualization is grounded in the tenet that geography is part of the human condition and that it can be divided into two distinct “paths”: one recording geographical information (evident within the earliest of Greco-Roman literature: e.g., Homer, Hesiod); and another theorizing about geographical information both in general “intellectual” thought (e.g., Pre-Socratics, Plato) and within dedicated treatises (e.g., Eratosthenes, Strabo). Although the volume devotes more discussion to the latter path, presenting itself as part of a continuous tradition of reception dating back to the Renaissance, when the study of such texts flourished, the first pathway is by no means ignored.

The first chapter, “The Kozy Kosmos of Early Cosmology” by Keyser, is the lengthiest individual contribution. Keyser’s thesis is both interesting and novel: the establishment of a radical, pre-Aristotelian model of the cosmos, termed the “kozy kosmos”. This said, it is unfortunate that the model’s application is often hidden behind summative descriptions of primary evidence. It could be argued that the summaries are necessary, since the establishment of Keyser’s model requires a comparative analysis of intercultural material from—Egypt, Israel, Mesopotamia, India, China, and the Americas, —and perhaps the readership is expected to be familiar only with Greco-Roman material (but why, then, does the volume’s title utilize the broader framework of “ancient”?). There are clearly instances, however, where the comparative evidence could have been more selective: case in point, the Mayan “cradle cosmology” (p. 15-16). This section’s evidence is minimal (especially in comparison to that of the other civilisations) and it appears—to this reviewer—to have been included only for the sake of being comprehensive rather than for illustrating some unique element of the model. The

reader's feeling of fatigue is not helped by the large number of subheadings and distinct sections into which this chapter is divided—for example, pages 43-44 include no fewer than five distinct subheadings. This aside, the analysis of the *kozy kosmos* model is enlightening and does, as Keyser suggests (e.g., pp. 19-20), bring a new perspective to the highly fragmentary cosmological musings of early pre-Socratic thinkers and poets. For example, the perspectives of the Milesian philosophers receive noteworthy clarification via the *kozy kosmos* model by associating the four elements with the creation process within the primordial chaos (pp. 30-32). It is when this kind of analytical discussion comes to the fore that Keyser's "new direction" is clear.

Chapter two, "Timosthenes of Rhodes" by Roller, provides a translation of and commentary for the treatise *On Harbours*. This is perhaps one of the more valuable individual contributions of the volume since, as Roller notes, there have only been two previous editions of the fragments of *On Harbours*—Wagner (1884) and FGrHist (2013: BNJ 354)—with this being the first in English. As with any good commentary, Roller begins with an overview of Timosthenes' life and works and the context of this highly fragmentary treatise. While there are no ground-breaking revelations in this introductory section (which follows established scholarly consensus),^[1] the accessible overview will be of great use to students unfamiliar with such material. Roller's translations are also highly accessible: written in easy-to-read prose with clear indicators of authorial asides and inter- and intra-textual references. The accompanying commentary expounds upon Timosthenes' use within the sources and identifies how the fragments relate to one another.— This discussion follows Roller's novel renumbering of the fragments to structure them according to the treatise's "geographical orientation". There is, however, a complete lack of discussion regarding textual variants and only very minor references to specific vocabulary (and when this does occur, the Greek words are always transliterated). This is not surprising, since the Greek text has not been included, a fact that appears to reflect a deliberate choice (perhaps for accessibility?). It is somewhat unfortunate that those with an interest in textual criticism are still without an English contribution but, as Roller includes both the Wagner and the BNJ numbering, cross-referencing with these alternate sources is remarkably straightforward.

Chapter three, "The politics of cartography" by Irby, presents cartography as a literary genre (rather than as an exclusively pictorial exercise) and considers how it is utilized by both poets and scientists for political ends. The Iliadic shield of Achilles is the first example that Irby explores, and it forms a most natural starting point for the discussion. It is equally unsurprising that Irby's paper culminates in a discussion of geopolitical themes in Vergilian epic, in particular the map upon Aeneas' shield. While it appears that the author's primary focus is Vergilian epic (this discussion, pp. 91-101, is as lengthy as all the prior case studies combined), the earlier discussions remain significant. The analysis of Euripides *Ion* (pp. 86-88) is particularly noteworthy, clearly illustrating the "propaganda value" of maps within the play. This section builds upon recent analyses of the *Ion* as political and/or propagandist writing,^[2] and yet Irby's contribution regarding the geopolitical nature of *Ion*'s role in the play (i.e., as the founder of all of Greece) and the expression of this via (textual) maps is particularly novel. Yet, the chapter's analysis often wanders outside the boundaries of "politics" and "cartography" (as initially established by Irby). For example, the Milesians' (pp. 82-85) use of cartography is presented as political only in the most general sense (i.e., men are political creatures by nature and the polis is an innately political institution). Furthermore, Irby explicitly acknowledges that the ephrasis of Jason's cloak in Apollonios of Rhodes' *Argonautica*

(pp. 88-91) is not a map even in a broad sense of the term (arguing instead for its inclusion via thematic links). Thus, one wonders if the focus on map making might have been reframed via a more general focus upon the geopolitical nature of texts. While attempts to create links with the concept of “maps” or map-making often form the weaker parts of Irby’s analysis, such a reframing would logically reflect the metaphorical expression of cartography that Irby initially argues for and utilizes from the outset.

Chapter four and Irby’s second contribution to the volume, “Tracing the Orbis terrarum from Tingentera”, explores first century geographer Pomponius Mela’s Latin treatise, the *Chorography*. The *Chorography* is a notable geographical work given that it is the earliest extant example of its kind in Latin. Any detailed treatment of this work in English is a welcome addition to contemporary scholarship: it was not until 1998 that the work first received an English translation and detailed analyses since then (in English) have been few and far between.[3] With this in mind, Irby’s chapter presents itself as a remarkably accessible discussion for students of ancient geography who may be unfamiliar with this text (this is, perhaps, a point of continuity with chapter 2). Irby attends, for example, to the context in which Mela wrote, the influences upon his writing, etc. Furthermore, Irby’s analysis of the description of Hispania in comparison to that represented in Caesar’s *Gallic Wars* (pp.130-134), which is built upon an acknowledgment of Mela’s cultural Romanitas, is a novel idea: this is a valuable “new direction” in contemporary explorations of the *Chorography*. It is interesting, however, that Irby does not frame this new idea through comparison to the earlier work of Roger Batty, who had first noted (as Irby does here) that Mela’s hometown of Tingentera occupies a unique central position within the work.[4] To be clear, Irby’s nuanced presentation of Mela as a Roman author and stylist departs significantly from Batty’s overstated position that Mela had little interest in the Greco-Roman world;[5] however, drawing out this contrast would have assisted in furthering the volume’s sense of continuity regarding its overall theme of “new directions”.

The fifth and final chapter, “Mutuo metu aut montibus” by Jones-Lewis, explores the ethno-geographic theory of environmental determinism (i.e., “the notion that the physical environment directs and drives the way in which inhabitants of that region grow and develop”, p. 136) in relation both to the *Germania* of Tacitus and to earlier Roman geographical writings within the literary milieu of this work. As a “modern” geographical concept, environmental determinism flourished in the early 20th century but quickly came to share a complicated ideological relationship with notions of imperialism, racism, and colonisation.[6] Thus, while often problematic in contemporary settings and applications, Jones-Lewis here presents a solid argument for considering this concept within the wider classical tradition and, in particular, the way Romans thought about their imperial expansion(s). Yet, these arguments and their application to Tacitus and his *Germania* are not this chapter’s “new direction”: Benjamin Isaac’s much earlier monograph on racism in classical antiquity had already thoroughly explored this thesis.[7] What sets this chapter apart is the tracing of these themes through Tacitus’ sources and predecessors, analysis of Tacitus’ acceptance and rejection of environmental determinism—in regard to the use/influence of Caesar’s *Gallic War*, in particular [8]—and analysis of the way(s) this phenomenon may have been understood by Tacitus’ audience. Thus, Caesar forms something of a leitmotif within Jones-Lewis’ mapping of Tacitus’

environmental determinism and the reading of an expansionist agenda in the Germania fits well with his much earlier presentation of the Germans and their combative relationship with Rome.

That there is no concluding section to this volume speaks—to this reviewer at least—of the difficulty in tying together its great diversity into something more cohesive than acknowledging the various “new directions”. Each individual chapter demonstrates a degree of novelty in discussing its chosen subject matter; however, the chapters remain, by and large, independent from one another. The consequence of this is that the volume will likely only be consulted for specific contributions rather than being of interest to a readership with a more holistic inclination.

Authors and titles

“Introduction”, Duane W. Roller (pp. 1-4) Ch 1. “The Kozy Kosmos of Early Cosmology”, Paul T. Keyser (pp 5-55) Ch 2. “Timosthenes of Rhodes”, Duane W. Roller (pp. 56-79) Ch. 3 “The Politics of Cartography: Foundlings, Founders, Swashbucklers, and Epic Shields”, Georgia L. Irby (pp. 80-102) Ch. 4 “Tracing the Orbis Terrarium from Tengerentara”, Georgia L. Irby (pp. 103-134) Ch. 5 “Mutuo metu aut montibus: Mapping Environmental Determinism in the Germania of Tacitus”, Molly Ayn Jones-Lewis (pp. 135-160)

Notes

[1] C.f. F. Prontera (2013) “Timosthenes and Eratosthenes: Sea Routes and Hellenistic Geography”. In K. Buraselis, M. Stefanou, & D. Thompson (eds.), *The Ptolemies, the Sea and the Nile: Studies in Waterborne Power* (pp. 207-217), Cambridge; H. A. Gärtner (2007) “Timosthenes of Rhodes”. In H. Cancik & H. Schneider (eds.), *Brill’s Encyclopaedia of the Ancient World: New Pauly*, Leiden; D. Meyer (1998) “Hellenistische Geographie zwischen Wissenschaft und Literatur: Timosthenes von Rhodos und der griechische Periplus”. In W. Kullmann, J. Althoff & M. Asper (eds.), *Gattungen wissenschaftlicher Literatur in der Antike* (pp. 193–215), Tübingen. The exception here may be Roller’s suggestion that fragments 36-37 should be excluded from *On Harbours* and, due to their cultic content, should be associated with the *Exegetikon*.

[2] Studies not referenced by Irby include, e.g.: M. Vickers (2014) “Politics and Challenge: The Case of Euripides’ *Ion*”, *The Classical World*, 107(3), pp. 299-318; L. Athanassaki (2010) “Art and Politics in Euripides’ *Ion*: The Gigantomachy as Spectacle and Model of Action”. In A. M. González de Tobia (ed), *Mito y performance: De Grecia a la modernidad* (pp. 199-242), La Plata.

[3] F. E. Romer (1998) *Pomponius Mela’s Description of the World*, Ann Arbor. Cf. J. Hind (1999) “Pomponius Mela on Colonies in West and East”. In G. R. Tsetschladze (ed.), *Ancient Greeks West and East* (pp. 77–84), Leiden; R. Scott Smith (2016) “Between Narrative and Allusion: Mythography in Pomponius Mela’s *Chorography*”, *Polymnia* no. 2, pp. 87-119.

[4] R. Batty (2000) “Mela’s Phoenician Geography”, *Journal of Roman Studies*, 90, pp. 70-94.

[5] See Batty (2000) 93.

[6] Alongside Jones-Lewis’ own comments on this (e.g., p. 155), see, e.g., B. Isaac (2006) “Proto-racism in Graeco-Roman antiquity”, *World Archaeology*, 38:1, pp. 32-47; and, from a non-classical perspective, M. Bassin (1992) “Geographical determinism in Fin-de-siècle Marxism: Georgii Plekhanov and the environmental basis of Russian history.” *Annals of the Association of American Geographers* 82.1, pp. 3-22.

[7] While Jones-Lewis makes reference to Isaac (2013), see also Isaac’s earlier article (2006) “Proto-racism in Graeco-Roman antiquity”(cited in n. 6); both of which discuss Tacitus’ view of the Germans in the Germania as an expression of environmental determinism.

[8] This reading of Caesar is explicitly noted by Jones-Lewis to be distinct from that of Isaac (see, e.g., p. 140 and n.14).

Please visit the site: <https://bmcr.brynmawr.edu/2021/2021.07.09/>

MACHINE LEARNING BASED ASSEMBLY OF FRAGMENTS OF ANCIENT PAPYRUS

Roy Avitbul, Ilan Shimshoni, and Jonathan Ben-Dov,

Journal on Computing and Cultural Heritage 14/33 (2021).

ABSTRACT:

The task of assembling fragments in a puzzle-like manner into a composite picture plays a significant role in the field of archaeology as it supports researchers in their attempt to reconstruct historic artifacts. In this article, we propose a method for matching and assembling pairs of ancient papyrus fragments containing mostly unknown scriptures.

Papyrus paper is manufactured from papyrus plants and therefore portrays typical thread patterns resulting from the plant's stems. The proposed algorithm is founded on the hypothesis that these thread patterns contain unique local attributes such that nearby fragments show similar patterns reflecting the continuations of the threads. We posit that these patterns can be exploited using image processing and machine learning techniques to identify matching fragments. The algorithm and system which we present support the quick and automated classification of matching pairs of papyrus fragments as well as the geometric alignment of the pairs against each other.

The algorithm consists of a series of steps and is based on deep-learning and machine learning methods. The first step is to deconstruct the problem of matching fragments into a smaller problem of finding thread continuation matches in local edge areas (squares) between pairs of fragments. This phase is solved using a convolutional neural network ingesting raw images of the edge areas and producing local matching scores. The result of this stage yields very high recall but low precision. Thus, we utilize these scores in order to conclude about the matching of entire fragments pairs by establishing an elaborate voting mechanism. We enhance this voting with geometric alignment techniques from which we extract additional spatial information. Eventually, we feed all the data collected from these steps into a Random Forest classifier in order to produce a higher order classifier capable of predicting whether a pair of fragments is a match.

Our algorithm was trained on a batch of fragments which was excavated from the Dead Sea caves and is dated circa the 1st century BCE. The algorithm shows excellent results on a validation set which is of a similar origin and conditions. We then tried to run the algorithm against a real-life set of fragments for which we have no prior knowledge or labeling of matches. This test batch is considered extremely challenging due to its poor condition and the small size of its fragments. Evidently, numerous researchers have tried seeking matches within this batch with very little success. Our algorithm performance on this batch was sub-optimal, returning a relatively large ratio of false positives. However, the algorithm was quite useful by eliminating 98% of the possible matches thus reducing the amount of work needed for manual inspection. Indeed, experts that reviewed the results have identified some positive matches as potentially true and referred them for further investigation.

Please visit the site: <https://dl.acm.org/doi/10.1145/3460961>

EIAHΣEIZ - NEWS RELEASE

TURKEY DISCOVERS NEW SITES NEAR FAMED GOBEKLITEPE

Turkish culture and tourism minister says they have spotted 11 new major hills on 100-kilometer line around ancient site

Turkey announced Sunday that it has discovered 11 new hills around the famed ancient site of Gobeklipe in southeastern Sanliurfa province.

"We have [discovered] 11 more major hills on a 100-kilometer line around Gobeklipe. Here, we will give the details for the first time, and now call it 12 hills," Culture and Tourism Minister Mehmet Nuri Ersoy said at an event in Sanliurfa.

Speaking to reporters, Ersoy said a "major study" on the 12 hills is about to be completed and will be presented in September.

He said the area could even be referred to as the "pyramids of southeast Turkey."

"When you look at Mesopotamia, this region has a unique culture. It has its own registered gastronomy. It has many products. And when you combine that with its unique archaeological value, it's a wonderful thing," he added.

Citing the establishment of Turkey's Tourism Promotion and Development Agency in 2019, Ersoy said the main goal of the agency is "to spread tourism across our 81 provinces in Turkey by 2023."

Gobeklipe has been on UNESCO's World Heritage Tentative List since 2011. It was discovered in 1963 when researchers from the universities of Istanbul and Chicago were working at the site.

In joint work at the site since 1995, the German Archaeological Institute and Sanliurfa Museum have found T-shaped obelisks from the Neolithic era towering three to six meters (10-20 feet) high and weighing 40-60 tons.

During the excavations, diverse 12,000-year-old artifacts such as human statuettes 65 centimeters (26 inches) high were also unearthed.

Please visit the site: <https://www.yenisafak.com/en/news/turkey-discovers-new-sites-near-famed-gobeklipe-3575342>

SCIENTISTS HAVE REVIVED EXTINCT ISRAELI WHEAT STRAINS. NOW COMES THE TASTE TEST

For the first time, a large, commercial flour mill has joined scientists and other experts to revive the lost varieties of wheat of the Land of Israel Ronit Vered

Early in the afternoon, shortly after the dozens of invited guests arrived, David “Friedy” Friedman, chief food technologist of Stybel Flour Mills, and the company’s chief baker, Yuval Alhadeff, arranged loaves of bread for tasting on a round table. The handiwork of four bakers, the breads were made of white and whole-wheat flours ground from different varieties of wheat. Three of the latter strains were part of the collection of the Land of Wheat project, whose aim is to revive varieties of heirloom wheat that have disappeared from local fields in recent decades. The fourth loaf was made with a regular, modern type of flour; it was planted, so to speak, among the other breads to provide a basis for comparison during this first of two tasting events organized by Stybel last month.

“We received the wheat kernels from the Gilat Center for Arid and Semi-Arid Agricultural Research, and neither we nor the bakers know which of them is the modern commercial variety and which are heirloom varieties,” says Friedman, his eyes glittering. In his 80s today, he’s someone who seems to be perpetually young and thirsting for knowledge.

“At the moment,” he adds, “they are marked by letters – E, F, G, H – and only after the tasting will we find out which is which.”

In the meantime, scientists and other researchers collaborating in the Land of Wheat – a joint project of the Agricultural Research Organization at the Volcani Center, the Weizmann Institute of Science and local universities – were immersed at the tasting event in intense last-minute discussions, using Excel tables and checking databases.

The project’s collection, compiled over the past few years from archives of research centers and gene banks in Israel and internationally, currently comprises nearly 1,000 wheat lines or accessions, as experts refer to the different strains. Seeds found within a close geographical radius or those sharing certain common features have been collected and stored in envelopes as part of the project; recently some were discovered by researchers in long-forgotten boxes in a gene bank or in such far-flung places as a research center in Mexico.

“The Land of Wheat collection contains 945 lines at the moment,” notes doctoral student Sivan Frankin, who is studying the agronomic and genetic characterization of the collection’s lines of wheat.

In the modern era wheat has become one of a small number of agricultural crops – others are rice and corn – that supply the majority of humanity’s food. Most of today’s wheat originates in modern lines cultivated after World War II in the wake of the trauma of widespread hunger that it spurred and forecasts concerning global population growth. The underlying idea was to produce strains that were easy and inexpensive to cultivate,

which would feed millions of people. The scientists developing those postwar strains, apparently mostly in Japan, succeeded, with the result being that the new varieties essentially replaced the wheat accessions that had developed over hundreds and thousands of years, in accordance with different terrain conditions. However, the modern strains' diminished biological and genetic diversity has rendered the world's wheat production vulnerable – any numbers of diseases or pests can wipe out a whole crop – and caused the disappearance of heirloom varieties that had once given rise to fascinating culinary and cultural traditions.

These same processes, occurring over time and around the globe, were particularly evident in Mandatory Palestine and in Israel during its first decades, where significant geopolitical and demographic upheavals were taking place. In this country, unlike other places, modern strains of wheat were not even crossbred with local heritage varieties that would adapt better to the conditions here.

“The process of the displacement of the traditional lines from Israel's fields was completed almost fully in the 1980s,” says Frankin, who joined the Land of Wheat project in 2017, about two years after a group of scientific researchers and non-academic devotees of the heirloom concept – inspired by similar initiatives overseas – started to search for extinct wheat lines in gene banks and other research institutions here and abroad, in order to bring them together in one place.

In the past four years, the Land of Wheat project has been engaged in the propagation of various lines of wheat seeds, attempting to grow them in diverse conditions and locales, profiling their biological and genetic characteristics, and trying to winnow out certain varieties in order to focus on select ones with commercial and culinary potential.

The two tasting events that took place last month at the Ad Halom flour mill on the outskirts of Ashdod were not the first involving breads baked from local heritage strains. They were preceded by tastings at small artisanal bakeries and at a research center where certain lines were cultivated (in Gilat, for example, baker Doron Dagan worked closely with an agronomist, Dr. David Bonfil, adding culinary insight that would hopefully enrich the scientific developments). The Ad Halom events, though, marked the first time a tasting of breads made from lines of local heritage wheat was held at one of the country's major industrial mills.

“It's significant that Stybel and other large mills are opening their doors to us,” says Dr. Roi Ben-David from the Volcani Center's agricultural research organization. “The feeling at first was that they were a bit skeptical about the research we were doing – along the lines of, ‘Don't bother us with this passing craze’ – but in the past year channels of cooperation opened up.”

To which Frankin adds, “the big flour mills now also understand that development and cultivation of the modern strains focused on large crops at the expense of flavor and quality, and that the heritage varieties have added value. The fact that a big mill like Stybel is providing us with resources and time gives rise to the hope that a real change can be fomented.”

It will take a long time before the five vast silos of the huge mill – each of which holds 1,200 tons of wheat – fill up with locally grown seeds, not to mention heritage varieties.

In fact, that day may never arrive – Israel is too small for most of the grains it needs to be grown here – but the participation of a mill like Stybel in the search for improved flavors and nutritional values among the traditional varieties is good news. Perhaps this heralds a time when access to the flours produced from those strains will not solely be the preserve of those who can afford to buy bread at boutique bakeries.

At the appointed hour at the first of the two Stybel events, the guests – academics involved in research, along with bakers and farmers and “heritage enthusiasts” (but perhaps too few chefs and culinary experts with tasting experience from other realms) – entered the mill’s premises. The sounds of electronic messages arriving simultaneously over dozens of phones, signaled that the forms to be filled out had come in via WhatsApp. “There’s no one who saw the forms who didn’t want to change or add something,” agronomist Bonfil says.

Internationally, too, bakery-laboratory collaborations have been established in recent years in which farmers, millers and bakers work side by side, but no binding protocol or agreed terminology exists for bread tasting. “Everyone has their own method, and we drew up a questionnaire based on wine and olive oil tastings, and we know it’s not perfect,” he adds.

Only after long and precise rounds of tastings and data calculations did the Land of Wheat researchers reveal the names of the three heritage varieties from which the breads had been baked: Diar Alla, Lubnani Kisra and Palestinsaika – the latter originally collected by Russian botanist Nikolai Vavilov in southern Lebanon in the 1920s.

“The most successful, to my taste, is Lubnani Kisra,” according to Anomarel Ogen, one of the four bakers who made the experimental breads for the first, blind tasting.

“With modern wheat, in which the protein and starch composition is different, you very quickly get a flexible dough, which stretches easily and resumes its shape easily. Working with traditional wheat is harder. You need to adjust the processes to the wheat itself, which is something contemporary bakers like to do less, because the modern flours have made life easy.”

The first tasting, about two weeks ago, focused on heritage strains of non-durum wheat; the second one dealt with heritage varieties of durum wheat, which piqued the curiosity of artisanal bakers and others. The four bakers – Alhadeff, Ogen, Dagan and Shaheen Shaheen – received from Stybel flours that had been ground from four varieties of durum wheat – which has harder kernels and is genetically different from the non-durum type, and are much more typical of the traditional, indigenous strains that once thrived in our region.

“Of the almost 1,000 lines in the Land of Wheat collection, attesting to the region’s agricultural and cultural history, 700 are durum wheat varieties,” says Frankin.

“Our climate is better suited to durum wheat, especially in light of global warming,” notes Zvi Peleg from the Rehovot-based Faculty of Agriculture of the Hebrew University of Jerusalem. “Durum,” adds the professor, who is working on ways to cultivate modern types of that kind of wheat that will be better suited to climate change, “is the cultured

variety of the mother of wheat – the wild strain whose origin lies in our region, and there is no doubt that durum was what was grown here 5,000 years ago.”

Ogen, the baker who in the past two years has been researching this subject tenaciously, agrees about the potential of durum: “My interest in durum wheat sprang from my desire to create truly local breads.

When I started to look at the research literature, I realized that it focuses on making flour for pasta. The implicit assumption is that durum wheat is less suited to baking bread, and if at all, only for flat bread. But you don’t need to go far in order to understand that this is a mistake: It’s enough to hop over to Puglia in southern Italy. In my bakery I discovered that it’s not a problem to use durum also to bake breads from whole-wheat flours that have volume and presence. I find the profile of the flavors of durum wheats more interesting than that of regular wheats used in bread, and durum wheat has a longer shelf-life and a soft texture that I like.”

The two Stybel tastings – of the three lines of non-durum bread wheat and the three of durum, all heritage varieties – are only an example of the scientific-cultural potential of the Land of Wheat project.

“We are just scratching the surface,” says Ben-David, of the Volcani Center. “We focused, almost randomly, on 13 lines from a huge collection, which allowed us within a relatively short time to arrive at a point where we can supply seeds to small farm plots and to produce flour in a quantity sufficient for us to conduct experimental tastings like the ones at Stybel.”

“This is only a peek into the treasure chest,” Frankin agrees. “We won’t emerge from it with definitive conclusions, but we want to generate interest – among farmers, millers, bakers and also among consumers – and perhaps the demand that will grow from below will drive the wheels of change.”

Please visit the site: <https://www.haaretz.com/israel-news/MAGAZINE-scientists-have-revived-extinct-israeli-wheat-strains-now-comes-the-taste-test-1.9961620> [Go there for pix]

WHERE ARE THE FOREIGNERS OF THE FIRST INTERNATIONAL AGE? RESEARCHERS USE GENETIC AND ISOTOPIC DATA TO INVESTIGATE HUMAN MOBILITY AT THE BRONZE AGE CITY OF ALALAKH IN TURKEY

A new study published in PLOS ONE reports genetic and oxygen and strontium isotopic data for individuals buried at Alalakh, finding little evidence for the foreigners mentioned in texts.

The Bronze Age in the eastern Mediterranean has long been considered by researchers to have been the ‘first international age,’ especially the period from 1600-1200 BC, when powerful empires from Anatolia, Mesopotamia, and Egypt set up large networks of subordinate client kingdoms in the Near East. These empires fought, traded, and corresponded with one another, and ancient texts from the period reveal rich economic and social networks that enabled the movement of people and goods.

A new study conducted by an interdisciplinary team of archaeologists, geneticists, and isotope experts, and published in PLOS ONE, investigated the movement of people in this period at a single regional center, a Bronze Age city-state called Alalakh in present-day southeastern Turkey. Their results indicate that the majority buried at Alalakh were raised locally and descended from people who lived in the region.

The team’s goal was to see if the high levels of interregional connectivity evidenced by the architecture, texts, and artifacts found at the site during 20 years of excavations, sponsored by the Turkish Ministry of Culture and Tourism and Hatay Mustafa Kemal University, could be detected among the population buried at the city.

To do so, they conducted strontium and oxygen isotope analyses on tooth enamel, which can detect whether an individual grew up locally at Alalakh or moved there only during adulthood. The genetic data on the other hand can be used to determine where a person’s recent ancestors came from.

The isotope analysis identified several non-local individuals.

However, their DNA showed an ancestry that was local to Alalakh and neighbouring regions. “There are two possible explanations for our findings,” said co-lead author Stefanie Eisenmann from the Max Planck Institute for the Science of Human History. “Either these individuals are short-distance migrants from the region or return-migrants, people whose parents or grandparents originally came from Alalakh.”

Only one sampled individual, an adult woman, was not part of the local gene pool, instead showing ancestry that most closely matched groups in Central Asia. However, her isotopic signatures suggested a local upbringing. “We expected the isotope analysis to show that this person immigrated to Alalakh, since her genetic data was so different

from the rest of the population, so we were surprised to see that she was likely native to Alalakh. It could have been her parents or grandparents who made the move, instead,” explained Tara Ingman, the other lead-author of the study from Koç University.

While different types of mobility were identified, including short-distance, long-distance, and return migration, there were no complete foreigners in the dataset. Most people were born and raised at Alalakh and also their ancestors came from the region.

The dead at Alalakh were usually buried in simple pit graves and often with ceramic vessels close to their heads.

“There are several ways to explain this. It is possible that far less long-distance migrants were living at Alalakh than we had previously thought. Another possibility is that we haven’t found their graves, yet. Perhaps most individuals that came from far away were not buried directly at Alalakh, or in a way we cannot trace,” said Murat Akar, director of the excavations. en isotope analyses on tooth enamel, which can detect whether an individual grew up locally at Alalakh or moved there only during adulthood. The genetic data on the other hand can be used to determine where a person’s recent ancestors came from.

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NOTES

1. Max Planck Institute for the Science of Human History,
<https://www.shh.mpg.de/2014421/alalakh-mobility>

Please visit the site: <https://www.archaeology.wiki/blog/2021/07/01/where-are-the-foreigners-of-the-first-international-age/>

DID A COMET STRIKE 13,000 YEARS AGO CHANGE HUMAN CIVILIZATION AS WE KNOW IT? BY CHELSEA GOHD

Could a devastating comet impact in Earth's distant past have forever changed human civilization?

Scientists think that a cluster of comet shards may have smashed into Earth's surface 13,000 years ago, in the most catastrophic impact since the Chicxulub event killed off Earth's large dinosaurs about 66 million years ago. In a new study, a team led by Martin Sweatman, a scientist at the University of Edinburgh in Scotland, investigated the impact and how it could have shaped the origins of human societies on Earth.

While the first Homo sapiens emerged between 200,000 and 300,000 years ago, much farther in the past than this impact, the researchers found that this comet crash actually coincided with significant changes in how human societies self-organized.

The researchers investigated the theory that a comet struck Earth 13,000 years ago, analyzing geological data from the areas where they think it may have hit, namely North America and Greenland. They found high levels of platinum, evidence of extremely high temperatures that could have melted materials at the site and nanodiamonds, which scientists know can be created from explosions and can exist inside comets.

This work builds on previous research that has suggested that a significant impact may have preceded the beginning of the Neolithic period, the first part of the Stone Age in which a number of major developments in human civilization took place, including notable steps forward in agriculture, architecture and stone tools.

At this time in history, humans in the "Fertile Crescent," which encompassed countries we know today as Egypt, Iraq and Lebanon, were moving away from nomadic, hunter-gatherer lifestyles to more permanent settlements.

"This major cosmic catastrophe seems to have been memorialized on the giant stone pillars of Göbekli Tepe [in Turkey], possibly the 'World's first temple,' which is linked with the origin of civilization in the Fertile Crescent of southwest Asia. Did civilization, therefore, begin with a bang?" Sweatman said in a statement.

While the new study work is exciting and suggestive, the team acknowledges that more evidence and more research is necessary to better understand how this impact could have affected global climate and, ultimately, human civilizations, according to the statement.

Chelsea Gohd joined Space.com as an intern in the summer of 2018 and returned as a Staff Writer in 2019. After receiving a B.S. in Public Health, she worked as a science communicator at the American Museum of Natural History. Chelsea has written for publications including Scientific American, Discover Magazine Blog, Astronomy Magazine, Live Science, All That is Interesting, AMNH Microbe Mondays blog, [...]

Please visit the site: <https://www.livescience.com/comet-impact-neolithic-period-human-civilization.html>

RECONSTRUCTING MEDITERRANEAN SILVER TRADE

Scientists have reconstructed the Eastern Mediterranean silver trade, over a period including the traditional dates of the Trojan War, the founding of Rome, and the destruction of Solomon's Temple in Jerusalem.

The team of French, Israeli and Australian scientists and numismatists found geochemical evidence for pre-coinage silver trade continuing throughout the Mediterranean during the Late Bronze and Iron Age periods, with the supply slowing only occasionally. Silver was sourced from the whole north-eastern Mediterranean, and as far away as the Iberian Peninsula.

The team used high-precision isotopic analysis to identify the ore sources of minute lead traces found in silver Hacksilber. Hacksilber is irregularly cut silver bullion including broken pieces of silver ingots and jewellery that served as means of payment in the southern Levant from the beginning of the second millennium until the fourth century BCE. Used in local and international transactions, its value was determined by weighing it on scales against standardized weights.

It has been discovered in archaeological excavations in the region usually stored inside ceramic containers and it had to be imported as there was no silver to be mined in the Levant.

Presenting the research at the Goldschmidt geochemistry conference, Dr. Liesel Gentelli said “Even before coinage there was international trade, and Hacksilber was one of the commodities being exchanged for goods”.

The team analysed Hacksilber from 13 different sites dating from 1300 BCE to 586 BCE in the southern Levant, modern-day Israel and the Palestinian Authority. The samples included finds from ‘En Gedi, Ekron, and Megiddo (also known as Armageddon). They matched their findings with ore samples, and have shown that most of the Hacksilber came from the Southern Aegean and Balkans (Macedonia, Thrace and Illyria). Some were also found to come from as far away as Sardinia and Spain.

Lead researcher Liesel Gentelli (École normale supérieure de Lyon, France) said: “Previous researchers believed that silver trade had come to an end following the societal collapse at the end of the Late Bronze Age, but our research shows that exchanges between especially the southern Levant and the Aegean world never came to a stop. People around the Eastern Mediterranean remained connected. It's likely that the silver flowed to the Levant as a result of trade or plunder.

We do see periods of silver scarcity around the time of the Bronze to Iron Age transition, around 1300-1100 BCE. Some hoards from this period show the silver displaying unusually high copper content, which would have been added to make up for the lack of silver.

We can't match our findings on the silver trade to specific historical events, but our analysis shows the importance of Hacksilber trade from before the Trojan War, which some scholars date to the early 12th century BCE, through the founding of Rome in 753 BCE, and up to the end of the Iron Age in 586 BCE, marked by Nebuchadnezzar's destruction of Solomon's Temple in Jerusalem. After that, we see the gradual introduction of coinage, first as finds of several archaic coins and later a transition to a monetary economy in the southern Levant circa 450 BCE which made the trade of Hacksilber less relevant. However, this work reveals the ongoing and crucial economic role that Hacksilber played in the Bronze and Iron Ages economies”.

Commenting, Dr Matthew Ponting, Senior Lecturer in Archaeological Materials at the University of Liverpool said: “This is important new work that confirms our understanding of trade and exchange routes in the Early Iron Age Levant. The fact that all silver found in the region would have had to have been imported presents exciting possibilities to investigate trade routes more generally as well as to learn more about alloy use and preference during this important period of history”.

Please visit the site: <https://www.heritagedaily.com/2021/07/scientists-reconstruct-mediterranean-silver-trade-from-trojan-war-to-roman-republic/139625>

INKED MUMMIES, LINKING TATTOO ARTISTS WITH THEIR ANCESTORS, BY KRISTA LANGLOIS

As scientists find more tattoos on preserved remains from Indigenous cultures, artists living today are drawing from them to revive cultural traditions.

In the 1970s, hunters stumbled upon eight 500-year-old bodies preserved by the Arctic climate near Qilakitsoq, an abandoned Inuit settlement in northwest Greenland. Later, when scientists photographed the mummies with infrared film, they made an intriguing discovery: Five of the six females had delicate lines, dots and arches tattooed on their faces.

For thousands of years, tattoos were more than just body decoration for Inuit and other Indigenous cultures. They served as symbols of belonging, signified coming-of-age rituals, channeled spiritual beliefs or conferred powers that could be called upon while giving birth or hunting. Yet starting around the 17th century, missionaries and colonists intent on “civilizing” Indigenous people put a stop to tattooing in all but the most remote communities.

The practice so thoroughly disappeared in Greenland that Maya Sialuk Jacobsen, who spent her childhood there, worked for a decade as a Western-style tattooist before realizing that her Inuit ancestors had also been tattooists, albeit of a very different nature.

Today, Ms. Sialuk Jacobsen uses historical documents, artifacts and the Qilakitsoq mummies — several of which are now on display at the Greenland National Museum — to research traditional Inuit tattoo designs. Then she hand pokes or stitches the patterns onto the faces and bodies of Inuit women, and occasionally men, helping them connect with their ancestors and reclaim a part of their culture.

“I take great pride in tattooing a woman,” she said. “When she meets her foremothers in the next world, it will be like looking in a mirror.”

Without the physical record left by ancient tattooing, modern practitioners like Ms. Sialuk Jacobsen would have little evidence to guide their work. Fortunately, as more Indigenous tattooists around the world resurrect lost traditions, a small group of archaeologists is tracing tattooing through time and space, uncovering new examples of its role in historic and prehistoric societies. Together, the scientists and artists are showing that the urge to ink our bodies is deeply rooted in the human psyche, spanning the globe and speaking across centuries.

Put the needle on the record

Until recently, Western archaeologists largely ignored tattooing. Because of these scientists’ disinterest, tools made for tapping, poking, stitching or cutting human skin were cataloged as sewing needles or awls, while tattooed mummies “were regarded more

as objects of fascination than scientific specimens,” said Aaron Deter-Wolf, a prehistoric archaeologist at the Tennessee Division of Archaeology and a leading researcher in the archaeology of tattooing.

Even when the 5,300-year-old body of Ötzi the Iceman was recovered from the Italian Alps in 1991 bearing visible tattoos, some news reports at the time suggested the markings were evidence that Ötzi was “probably a criminal,” Mr. Deter-Wolf said. “It was very biased.”

But as tattooing has become more mainstream in Western culture, Mr. Deter-Wolf and other scientists have begun to examine preserved tattoos and artifacts for insights into how past people lived and what they believed.

A 2019 investigation into Ötzi’s 61 tattoos, for example, paints a picture of life in Copper Age Europe. The dots and dashes on the mummy’s skin correspond with common acupuncture points, suggesting that people had a sophisticated understanding of the human body and may have used tattooings to ease physical ailments like joint pain. In Egypt, Anne Austin, an archaeologist at the University of Missouri-St. Louis, has found dozens of tattoos on female mummies, including hieroglyphics suggesting the tattoos were associated with goddess worship and healing. This interpretation challenges 20th-century male scholars’ theories that female tattoos were simply erotic decorations or were reserved for prostitutes.

The scientific study of tattooed mummies also inspires practitioners like Elle Festin, a tattooist of Filipino heritage living in California. As co-founder of Mark of the Four Waves, a global community of nearly 500 members of the Filipino diaspora united through tattooing, Mr. Festin has spent more than two decades studying Filipino tribal tattoos and using them to help those living outside the Philippines reconnect with their homeland. One of his sources is the “fire mummies” — people from the Ibaloi and Kankanaey tribes whose heavily tattooed bodies were preserved by slow-burning fire centuries ago.

If clients are descended from a tribe that made fire mummies, Mr. Festin will use the mummies’ tattoos as a framework for designing their own tattoos. (He and other tattooists say that only people with ancestral ties to a culture should receive that culture’s tattoos.) So far, 20 people have received fire mummy tattoos.

For other clients, Mr. Festin gets more creative, adapting age-old patterns to modern lives. For a pilot, he says, “I would put a mountain below, a frigate bird on top of it and the patterns for lightning and wind around it.”

Yet while mummies offer the most conclusive evidence of how and where past people inked their bodies, they’re relatively rare in the archaeological record. More common — and thus more helpful for scientists tracking the footprint of tattooing — are artifacts like tattoo needles made of bone, shell, cactus spines or other materials.

To show that such tools were used for tattooing, rather than stitching leather or clothing, archaeologists such as Mr. Deter-Wolf replicate the tools, use them to tattoo either pig skin or their own bodies, then examine the replicas under high-powered microscopes. If

the tiny wear patterns made by repeatedly piercing skin match those on the original tools, archaeologists can conclude that the original artifacts were indeed used for tattooing.

Through such painstaking experiments, Mr. Deter-Wolf and his colleagues are pushing back the timeline of tattooing in North America. In 2019, Mr. Deter-Wolf was an author of a study that showed that the ancestors of modern Puebloan people were tattooing with cactus spines some 2,000 years ago in what is now the American Southwest. This year, he published a finding showing that people were tattooing with needles made of turkey bones in what is now Tennessee about 3,500 years ago.

Dion Kaszas, a Hungarian, Métis, and Nlaka'pamux tattoo practitioner and scholar in Nova Scotia, is learning how to create his own bone tattoo needles from Mr. Deter-Wolf and Keone Nunes, a Hawaiian tattooist. His goal, he said, is to “get back to that ancestral technology; to feel what our ancestors felt.” Because few examples remain of Nlaka'pamux tattooing, Mr. Kaszas uses designs from baskets, pottery, clothing and rock art. Research from other cultures shows that tattoo designs often mimic the patterns on other artifacts.

For Mr. Kaszas and others, tattooing isn't just a way to revive an Indigenous language nearly silenced by colonialism. It also has the power to heal wounds of the past and strengthen Indigenous communities for the future.

“The work our tattoos are doing to heal us is a different kind of work than our ancestors used them for,” Mr. Kaszas said. “That's a form of medicine, for people to look down at their arm and understand they're connected to a family, a community, the earth.”

Ink back from the brink

Although people from numerous cultures have reclaimed their tattooing heritage in the past two decades, there are many others who have had theirs obscured entirely by colonization and assimilation. As scientists pay more attention to tattooing, though, their work could bring more lost traditions to light.

Mr. Deter-Wolf hopes that archaeologists in other parts of the world will begin identifying tattoo artifacts using the methodology he and other North American scientists have pioneered, pushing back its footprint even further. He also oversees an online, open-source database of tattooed mummies, meant to correct popular misinformation and illustrate the geographic spread of such specimens. The list includes mummies from 70 archaeological sites in 15 countries — including Sudan, Peru, Egypt, Russia and China — but Mr. Deter-Wolf expects it to grow as infrared imaging and other technology uncover more inked skin on existing mummies.

Back in Greenland, Ms. Sialuk Jacobsen hopes that the Qilakitsoq mummies also have more secrets to yield. She is encouraging museum directors to examine other parts of the mummies' bodies, such as their thighs, with infrared imaging. Inuit women in other parts of the Arctic receive thigh tattoos as part of birthing rituals, but while historical drawings show thigh tattoos on Greenlandic women, there isn't yet any tangible evidence.

If the Qilakitsoq mummies do have thigh tattoos, Ms. Sialuk Jacobsen may one day copy the patterns onto women from the Qilakitsoq region, drawing a line between the generations of the past and those yet to come.

“Our tattoos are very selfless,” she said. They aren’t just for the woman receiving them, but for her grandmothers, her children and her entire community as well.

Please visit the site: <https://www.nytimes.com/2021/07/05/science/mummies-tattoos-archaeology.html?searchResultPosition=1>

15,000-YEAR-OLD PESTLES WERE FOUND, OFFERING INSIGHTS ON HOW COMMUNITIES BEGAN TO DEVELOP A CLOSE CONNECTION TO THEIR TERRITORY, BY ROSSELLA TERCATIN

Fifty-four basalt pestles dating back 15,000 years, uncovered in a cave in the Carmel area offer insights into the relations between the earliest communities who transitioned to a sedentary lifestyle and how they started to develop a close connection to their territory, research by Israeli and German scholars has shown.

The University of Haifa and University of Mainz project successfully located the source of the raw materials used by ancient Natufians to manufacture tools to process their food. It reveals that most of it came from different areas around Lake Kinneret, between 60 and 120 km. from the el-Wad Terrace site where they were found.

“Since we did not find evidence of basalt processing at the Carmel site, we assumed that the ancient Natufian hunter-gatherers of the Carmel would travel to the Kinneret, among other things, to bring the processed basalt vessels,” said University of Haifa archaeologist Prof. Danny Rosenberg, one of the authors of the paper recently published in the academic journal Scientific Reports.

Basalt is an especially hard type of rock that requires sophisticated knowledge and technology to avoid breaking it when it is cut.

Natufian communities lived in the area in the late Epipaleolithic period, 11,700-15,000 years ago, during the transition between the Paleolithic and the Neolithic eras, which was reflected in their lifestyle. The Natufians were still hunter-gatherers who were not able to produce their food but still lived in semi-permanent small settlements.

The trips of el-Wad Natufians to the Sea of Galilee could have happened according to two theories.

It is possible that only expert stonecutters would travel to the area, possibly taking the opportunity to exchange other objects along the way, although in light of the many and relatively distant sources of raw material researchers believe it is not very likely.

Another theory states that the whole community would go, maybe as part of their seasonal movements around the region. The stone-cutting technology was preserved and transmitted among the members of the community.

The researchers were not surprised to find out that these populations would journey so far. Previous studies had shown that they traveled even greater distances and maintained some form of commercial relations with regions that were even further away.

However, what especially intrigued them was that there were areas where the Carmel Natufians could have found the basalt much closer to home. They reason that those long trips might have been forced by the necessity to avoid rival communities.

“The advent of a sedentary way of life dovetailed with the emergence of an early sense of possession,” the researchers wrote. “As groups became more closely attached to a certain place and invested in their immediate surroundings, they probably began cultivating prefatory claims of ownership.

“In this vein, the Natufian culture is also notable for introducing a new sort of geopolitics: the emergence of socio-territorial entities, a landscape of more-or-less distinct spatial units attached to organic groups, probably separated from one another by unclaimed ‘buffer zones,’” they added. “As one group claims an area and its resources, it also denies it to others, setting into motion a dialectic of alienation and suspicion.”

According to Rosenberg, it is possible that the basalt sources closer to the Carmel were under the control of rival groups, which caused the el-Wad Natufians to travel as far as the Kinneret, an area that was almost uninhabited.

“The transition of some of the Natufian communities to permanent settlements and early forms of agriculture must also have led to the development of their territorial feelings and strengthened the connection between them and the environment of the sites in which they lived,” he said.

Please visit the site: <https://www.jpost.com/israel-news/15000-year-old-tools-shed-light-on-community-relations-in-ancient-israel-672478> [Go there for pix]

ANALYZING ANCIENT ANIMAL REMAINS

Animal teeth excavated from Bronze Age cities may answer fundamental questions about how early urban centers operated.

From around the 14th century B.C., the steady buzz of everyday urban life reverberated within the city walls of ancient Hattusa, the Bronze Age capital of the Hittite Empire in modern-day Turkey. Craftspeople fashioned clothing and jewelry for elites, cattle moved goods through narrow streets and worshippers visited temples for religious ceremonies.

Though not exactly like the hustle and bustle of modern-day cities, the flow of industry and commerce would be recognizable to residents of today's world. So, too, would many of the challenges that come with city life.

“Urbanism has been around for 5,000 years, and people have been dealing with the same problems we are faced with,” said Benjamin Arbuckle, associate professor in College of Arts & Sciences’ department of anthropology. “Disease, crowds, conflict and policing, it’s not new. We can look at solutions from the past that have worked or not worked.”

Arbuckle and Carolina graduate student Christine Mikeska are examining remains of animal teeth excavated from two Bronze Age cities — Hattusa and Tell Bderi — to explore fundamental questions about how these early urban centers supported populations of several thousand people.

How far did trading networks for livestock reach? How were economies structured? How centralized was control of staple goods? How did cities achieve stable food production?

By conducting biochemical analysis of dental remains and comparing that with geological samples of surrounding areas, researchers can pinpoint where animals were born and raised. This analysis can reveal insights about trade, economy and culture. Examination of lions’ teeth found within Hattusa, for example, shows that cubs were raised inside the city walls, likely by royals and rulers who wanted to project wealth and strength.

Mikeska and Arbuckle’s research is being conducted in collaboration with Germany’s Eberhard Karls University of Tübingen, a strategic partner of UNC-Chapel Hill. One of the oldest universities in Europe and recognized by the German Federal Ministry of Education and Research as a University of Excellence, Tübingen is one of five strategic partnerships Carolina has developed with institutions around the world to facilitate faculty and student exchanges, joint research and shared institutional resources.

“I am particularly interested in understanding social networks and interactions between different groups of people,” Mikeska said. “A lot of scholarship sort of assumes the state controls everything, but lots of groups and communities created their own ways of getting by or getting things they needed. People are not monolithic, and we can understand our own urban centers better if we acknowledge that.”

Consider the example of sheep and pigs. Rulers kept a tight grip on the trade of sheep, which were prized for their wool. But pigs were hard to transport and, perhaps mindful of

cultural taboos around consumption of pork, city rulers wouldn't have deigned to meddle in this particular market. But there's evidence that many Hattusians raised pigs and the trade of swine products, such as lard, would have operated outside the state-controlled economy.

Mikeska and Arbuckle operate in a subfield of archaeology called zooarchaeology, which examines remains of animals to shed light on ancient life. Tübingen's world-renowned archaeology program has sponsored excavations in the Middle East for decades. Carolina's partnership with Tübingen helps give Mikeska and Arbuckle access to a vast assemblage of remains from sites in modern-day Turkey and Syria.

The materials are shipped from Germany to Chapel Hill, where the lab analysis is conducted, allowing the partners to continue their research collaboration even while international travel was severely restricted because of the pandemic.

"Tübingen has great faculty and extensive collections from this part of the world, so it's a natural partnership for us," Arbuckle said.

Mikeska and Arbuckle have partnered with Tübingen zooarchaeology researcher Britt Starkovich on the project.

Many of the dental samples Mikeska and Arbuckle have analyzed show animals that were raised in or near the city, but a few samples have come from much farther afield. Their findings will help shape understanding of the reach and strength of the Hittite Empire as well as the basic functioning of cities as humans first encountered the benefits and challenges of urban life.

"We can document on a map the social networks, the economic networks in one of the earliest human experiments of living in a city," Arbuckle said. "We can see how smart people figured out solutions, and we can examine that in the context of our own urban planning. People have been living this way for a really long time, and we can learn from the techniques and methods that supported them."

Arbuckle's research received funding from a Global Partnership Award through the Chancellor's Global Education Fund. Learn more about how the fund supports Carolina's global priorities.

Please visit the site: <https://thewell.unc.edu/2021/07/08/analyzing-ancient-animal-remains/> [Go there for pix]

DID ANCIENT ASTRONOMERS SET A MESSAGE IN STONE FOR US? BY SAM DINKIN

Back in 2003, The Space Review first started repeating the story of the danger of large impacts (“Asteroids are probably a threat. Maybe?” The Space Review, September 9, 2003). It is possible we are recapitulating a tradition that started more than 11,000 years before present (BP). Ancient astronomers may have provided us with a report about what may be “the worst day ever in human history” according to Martin B. Sweatman and Dimitrios Tsikritsis (“Decoding Göbekli Tepe with Archaeoastronomy: What does the fox say?”, 2017).

The researchers used software that shows the ancient sky, Stellarium 0.15, to match the stars visible in Göbekli Tepe Turkey in the last 13,000 years or so. They tested the hypothesis that the Vulture Stone was a report on a comet strike. They correlate the constellations that may be depicted on the Vulture Stone with a specific date, 12,970 BP \pm 250 years. That date, they believe, is consistent with a comet strike that may have caused the “black mat” at the Younger-Dryas boundary (YDB) that includes nanodiamonds. The YDB was dated to some time between 12,900 and 11,600 years before present.

So one translation of the Vulture Stone writing is, as Neil deGrasse Tyson put it in 2013, “How’s your space program coming along?”

Sweatman and Tsikritsis further hypothesized that other portions of the stone are a realist depiction of what a visual observation of a large comet impact might look like to someone near enough to see it, but far enough away to survive it. The black mat provides evidence of multi-continent firestorms that may have triggered an impact winter—a very good candidate for the consequences of what may have happened on the worst day ever in human history.

The oldest layers at Göbekli Tepe date to 11,000 years before present.

That suggests, if the Sweatman and Tsikritsis hypothesis is correct, that the astronomers at Göbekli Tepe depicted historical events that happened about 2,000 years prior to the building of the observatory.

Yes. Not pre-history. The glyphs on these pillars may be a proto-language that predates cuneiform by 4,000 to 6,000 years.

So one translation of the Vulture Stone writing is, as Neil deGrasse Tyson put it in 2013, “How’s your space program coming along?”

An extraordinary claim requires extraordinary proof. The claim that a stone pillar was important enough to (re-)chisel 2,000 years later is extraordinary. And so is the implication that an ancient astronomical team used, or could decode, the symbols for constellations thousands of years after they were first recorded. And so is the implied claim that the people who saw a major comet strike had the free time to memorialize it,

in a durable way, in the midst of an event that may have ended the civilizations of the Clovis people and others—there are sites featuring the black mat near Göbekli Tepe.

Andrew Collins, whose sky chart image is above, shows that there is a simpler alternative hypothesis. In 11,621 BP, the closest star to Earth's celestial north pole was not as close as Polaris's declination of 89° 16'. The starless area at the celestial north pole may have been a central feature of the beliefs of the astronomers at Göbekli Tepe. "Almost certainly [the circle on the Vulture Stone] represents the northern celestial pole, long seen in shamanic tradition as the 'hole in the sky' through which human souls could access the Upper World."

So another translation may be, "This way to the Upper World."

Please visit the site: <https://www.thespacereview.com/article/4206/1> [Go there for pix]

EGYPTIAN JAPANESE ARCHAEOLOGICAL MISSION TO EXCAVATE SECOND KHUFU BOAT COMPLETED, BY NEVINE EL-AREF

Cooperation between Egyptians and the Japanese in the Grand Egyptian Museum project started in 2006, when the JICA provided financial support for the construction of the Grand Egyptian Museum.

Sakuji Yoshimura, the head of the Egyptian Japanese archaeological mission and president of Higashi Nippon International University, and Professor Emeritus of Waseda University have completed the excavation of the second Khufu Boat from the pit in which it was discovered beside Khufu pyramid in the Giza plateau.

Issa Zidan, the director-general of executive affairs for restoration at the Grand Egyptian Museum and the supervisor of the restoration work of the second Khufu Boat, explained that nearly 1,700 wooden pieces were extracted from 13 layers inside the pit, noting that the registration and documentation of all pieces have been done, as well as the initial restoration of most of these pieces was completed.

He also added that, so far, 1,343 pieces were transferred to the Grand Egyptian Museum, where preparations are underway for starting the second phase that include the final restoration work, as well as conducting the necessary studies for assembling and re-installing the boat that will be displayed next to the first one inside the new building dedicated for King Khufu's boats, which is now being constructed at the Grand Egyptian Museum.

Omura Yoshifumi, the chief representative of the Japan International Cooperation Agency (JICA) Egypt Office, said that the JICA will provide a \$3 million grant for completion of the final restoration work and reassembly of the boat for its display in the museum, in addition to the \$2 million grant that was provided in 2013, which supported the excavation and extracting process of the wooden pieces of the boat from the pit.

The project of restoring and extracting the wooden pieces of the second Khufu Boat is one of the largest restoration projects that represent the aspects of fruitful cooperation between Egypt and Japan, with the support of the JICA.

Cooperation between Egyptians and the Japanese in the Grand Egyptian Museum project started in 2006, when the JICA provided financial support through two soft loans of official development assistance for the construction of the museum at the request of the Egyptian government.

Since 2008, the JICA has been providing technical cooperation through the Egyptian Japanese joint conservation project for the restoration, documentation, packaging, and transfer of 72 artifacts — among which were some of King Tutankhamun's collection — from the Egyptian Museum in Tahrir and other sites to the Grand Egyptian Museum.

About 90 Japanese experts participated in this project, and a number of high-tech technical equipment were provided within the project, such as a digital microscope, a portable X-ray machine, and an electric forklift to carry heavy artifacts safely.

Ambassador Noke expressed his appreciation for the fruitful cooperation with the Ministry of Tourism and Antiquities led by Minister of Tourism and Antiquities Khaled El-Enany and the sincere efforts of Major-General Atef Moftah — the general director of the Grand Egyptian Museum project — and the surrounding area to realise all this progress, stressing that the Grand Egyptian Museum is a symbol of Egyptian Japanese friendship.

From his side, Yoshifumi expressed appreciation for the Egyptian government's strong leadership in making such great progress in the Grand Egyptian Museum's construction and related works towards its opening, emphasising that he is proud that the JICA takes part in preserving the world's treasures in Egypt to the future generations through this project.

Please visit the site:

<https://english.ahram.org.eg/NewsContentP/9/416631/Heritage/Egyptian-Japanese-archaeological-mission-to-excava.aspx> [Go there for pix]

2,500-YEAR-OLD STATUES, INSCRIPTION UNEARTHED IN WESTERN TURKEY

Two 2,500-year-old marble statues and an inscription have been found during excavations at the Temple of Zeus Lepsynos, one of the best preserved Roman temples of Anatolia, in Turkey's western Mugla province.

Built in the 2nd century B.C., the temple is located in the ancient city of Euromos.

Abuzer Kizil, head of the excavation committee and faculty member at Mugla Sitki Kocman University's Department of Archeology, told Anadolu Agency on Sunday that the artifacts were found during the restoration efforts unexpectedly, and came as a surprise to the world of archeology.

“We have unearthed two very important links of the missing archaic sculpture of the Caria region, and an inscription dating to the Hellenistic period,” he said.

Kizil added that the sculptures were categorized as kouros, a modern term given to free-standing ancient Greek sculptures.

“One of the two kouros unearthed at Euromos is naked, the other is wearing armor and a short skirt. The armor is made of leather and it is remarkable that both statues have a lion in their hands.

Iconographically, the lion holds great significance ... we have not been able to find exact copies of either of the statues so far,” Kizil said.

He said the naked statue has a lion in his hand indicating it is most likely Apollo.

Kizil said the inscription from the Hellenistic period is expected to reveal important insights on the Carian history, and efforts to decipher it are continuing.

Please visit the site: <https://www.yenisafak.com/en/life/2500-year-old-statues-inscription-unearthed-in-western-turkey-3576272> [Go there for pix]

MEMORIAL TOMB OF ANCIENT GREEK ASTRONOMER ARATUS UNEARTHED IN TURKEY, BY PATRICIA CLAUS

Archaeologists working in the ancient Greek city of Soli Pompeipolis in the southern Mersin province in Turkey have unveiled the memorial tomb of the Greek poet and astronomer Aratus, who was born in 315 BC.

The city, located in the ancient region of Paphlagonia, was still prominent during Roman times but was only rediscovered in the 1800s with the unearthing of the ruins of Zımbılı Tepe in the Black Sea region of the country.

Soli Pompeipolis, lying just across the river from Taşköprü, in the Gökırmak (Greek: Amnias) Valley, in ancient times stretched as far as the Küre and Ilgaz mountains.

Site of ancient Greek tomb was significant in Roman and Greek world The tomb of the gifted poet and astronomer is being excavated by Professor Remzi Yağcı, who is the head of the Department of Museology at Turkey's Dokuz Eylül University.

According to the archaeologist, the discovery is of lasting importance to the history of the area and will be of great interest to travelers who will want to see the monument.

Speaking to interviewers from the Anadolu News Agency, Yağcı said “For the first time, a memorial tomb has been unearthed linked to the archaeology of the ancient city of Soli Pompeiopolis.”

“Aside from more familiar structures, such as the colonnaded streets, the ancient port, the theater, and the bathhouse, something very unique has been found. This find brings dynamism to the ancient city and can influence tourism in the region – for both those interested in cultural heritage and general visitors to the region.”

The unearthing of the ruins has been ongoing since July 20 of 2020, Yağcı said. Showing photographs of the unique discovery, he indicated the two rows of hexagonal structures and arches around the memorial tomb that had been unearthed by his workers.

Aratus was a popular poet and astronomer in antiquity The Greek poet and astronomer Aratus, in an illustration from the Renaissance era. His tomb was found at an ancient Greek site in Turkey. Credit: Public domain

“This place looks like a crater,” he explained, “and has a circular area (that could have been used by) an astronomer. We have also come across a solid and large monumental structure.”

Yağcı added that Aratus was widely known during both the Hellenistic and Roman periods and his works on astronomy, as well as his poetry, are still read and studied to this day.

Often, Aratus combined astronomy with poetry, creating unique works that were extremely popular in his time. He is best known for his work “Phenomena,” a hexameter poem that describes the constellations.

Additionally, he noted that NASA had named a crater on the moon after the brilliant Greek thinker, leading the archaeologist to hope that the tomb of the great man will one day be included on the UNESCO World Cultural Heritage List.

Please visit the site: <https://greekreporter.com/2021/07/11/memorial-tomb-of-ancient-greek-astronomer-aratus-unearthed-in-turkey/>

DNA FROM 1,600-YEAR-OLD IRANIAN SHEEP MUMMY BRINGS HISTORY TO LIFE

A team of geneticists and archaeologists from Ireland, France, Iran, Germany, and Austria has sequenced the DNA from a 1,600-year-old sheep mummy from an ancient Iranian salt mine, Chehrabad. This remarkable specimen has revealed sheep husbandry practices of the ancient Near East, as well as underlining how natural mummification can affect DNA degradation.

The incredible findings have just been published in the international, peer-reviewed journal *Biology Letters*.

The salt mine of Chehrabad is known to preserve biological material. Indeed, it is in this mine that human remains of the famed "Salt Men" were recovered, desiccated by the salt-rich environment. The new research confirms that this natural mummification process -- where water is removed from a corpse, preserving soft tissues that would otherwise be degraded -- also conserved animal remains.

The research team, led by geneticists from Trinity College Dublin, exploited this by extracting DNA from a small cutting of mummified skin from a leg recovered in the mine.

While ancient DNA is usually damaged and fragmented, the team found that the sheep mummy DNA was extremely well-preserved; with longer fragment lengths and less damage that would usually be associated with such an ancient age. The group attributes this to the mummification process, with the salt mine providing conditions ideal for preservation of animal tissues and DNA.

The salt mine's influence was also seen in the microorganisms present in the sheep leg skin. Salt-loving archaea and bacteria dominated the microbial profile -- also known as the metagenome -- and may have also contributed to the preservation of the tissue.

The mummified animal was genetically similar to modern sheep breeds from the region, which suggests that there has been a continuity of ancestry of sheep in Iran since at least 1,600 years ago.

The team also exploited the sheep's DNA preservation to investigate genes associated with a woolly fleece and a fat-tail -- two important economic traits in sheep. Some wild sheep -- the asiatic mouflon -- are characterised by a "hairy" coat, much different to the woolly coats seen in many domestic sheep today. Fat-tailed sheep are also common in Asia and Africa, where they are valued in cooking, and where they may be well-adapted to arid climates.

The team built a genetic impression of the sheep and discovered that the mummy lacked the gene variant associated with a woolly coat, while fibre analysis using Scanning Electron Microscopy found the microscopic details of the hair fibres consistent with hairy or mixed coat breeds. Intriguingly, the mummy carried genetic variants associated

with fat-tailed breeds, suggesting the sheep was similar to the hairy-coated, fat-tailed sheep seen in Iran today.

"Mummified remains are quite rare so little empirical evidence was known about the survival of ancient DNA in these tissues prior to this study," says Conor Rossi, PhD candidate in Trinity's School of Genetics and Microbiology, and the lead author of the paper.

"The astounding integrity of the DNA was not like anything we had encountered from ancient bones and teeth before. This DNA preservation, coupled with the unique metagenomic profile, is an indication of how fundamental the environment is to tissue and DNA decay dynamics.

Dr Kevin G Daly, also from Trinity's School of Genetics and Microbiology, supervised the study. He added:

"Using a combination of genetic and microscopic approaches, our team managed to create a genetic picture of what sheep breeds in Iran 1,600 years ago may have looked like and how they may have been used.

"Using cross-disciplinary approaches we can learn about what ancient cultures valued in animals, and this study shows us that the people of Sasanian-era Iran may have managed flocks of sheep specialised for meat consumption, suggesting well developed husbandry practices."

Journal Reference:

Conor Rossi, Gabriela Ruß-Popa, Valeria Mattiangeli, Fionnuala McDaid, Andrew J. Hare, Hossein Davoudi, Haedeh Laleh, Zahra Lorzadeh, Roya Khazaeli, Homa Fathi, Matthew D. Teasdale, Abolfazl A'ali, Thomas Stöllner, Marjan Mashkour, Kevin G. Daly. Exceptional ancient DNA preservation and fibre remains of a Sasanian saltmine sheep mummy in Chehrābād, Iran. *Biology Letters*, 2021; 17 (7): 20210222 DOI: 10.1098/rsbl.2021.0222

Please visit the site:

<https://www.sciencedaily.com/releases/2021/07/210714110531.htm>

FRENCH-EGYPTIAN ARCHEOLOGY **MISSION DISCOVERS MILITARY VESSEL,** **GREEK FUNERARY IN SUNKEN CITY**

Archaeologists have found rare remains of a military vessel and a Greek funerary complex at Thonis-Heracleion in an ancient sunken city that once served as Egypt's main Mediterranean port.

The find was made during underwater excavations at Thonis-Heracleion, a one-time bustling metropolis that sat on the edge of the Nile river where it meets with the Mediterranean sea.

Thonis-Heracleion was for centuries considered Egypt's largest port in the area until Alexander the Great founded the coastal city of Alexandria in 331 Before Christ (BC).

The city, submerged following a series of earthquakes and tidal waves, was discovered in 2001.

"An Egyptian-French mission... found the debris of a military vessel from the Ptolemaic era and the remains of a Greek funerary complex dating to the fourth century BC," the antiquities ministry said.

Flat-bottomed with large oars, mast, and sails, the 25-metre-long vessel was often used for navigation within the Nile Delta, according to preliminary studies.

A diver is unearthing pieces of pottery in the sunken city of Thonis-Heracleion in Abu Qir bay, on Egypt's northern Mediterranean coast on 19 July, 2021. © AFP/HO/Egyptian Ministry of Antiquities

Archaeologists say the ship which was supposed to dock near Amun Temple in the area sank following the famed ancient temple's collapse in an earthquake in the second century BC.

"Finds of fast ships from this age are extremely rare," according to Franck Goddio of the European Institute for Underwater Archaeology (IEASM) which led the mission.

Underwater archaeologists also found a funerary complex showing the presence of Greek merchants in the area during the late period of ancient Egypt.

The antiquities ministry said Greeks had dominated the region at the time and built funerary temples in the vicinity of Amun Temple.

Remnants of these temples were found "in excellent condition" underwater, it added.

The latest findings testify to "the richness of temples in the city which now lies under Mediterranean sea water", the ministry said.

Please visit the site: <https://www.rfi.fr/en/international/20210720-french-egyptian-archeology-mission-discovers-military-vessel-greek-funerary-in-sunken-city> [Go there for pix]

THE ETHICS OF REMOTE SENSING IN ARCHAEOLOGY, BY KEVIN SLIMAN

When using modern technology in archaeology, researchers can cause potential harm to the communities they are observing. A recent paper led by a team of Penn State researchers explores the ethics of archaeological remote sensing in sacred cultural spaces.

Remote sensing — beginning with aerial photography — has been used for decades in one form or another in archaeology, but, the discussion on the ethical use of the information gathered through these methods is a newer topic, according to a team of researchers.

Dylan Davis, doctoral student in archaeology at Penn State, said that archaeologists can use a wide range of technologies to better see and understand how people have interacted with earth systems. This includes older methods such as photography but also includes newer technology, such as satellite imagery and LiDAR (Light Detection and Ranging), which provide detailed information of the surface below.

“Remote sensing is a tool, and it can be used for great things, or it can be used in ways that are extremely harmful,” said Davis, a member of the Olo Be Taloha Lab. “If you do not communicate what you are trying to do with these technologies with local communities, especially indigenous communities who may have been there for hundreds or thousands of years, the research you put together could tell a narrative that implicates them in something they are not responsible for.”

The researchers published their results in *Archaeological Prospection*.

A hypothetical example would be a research report that incorrectly states an observed community was directly responsible for destroying a rainforest, said Davis. Using the data from the report, the government then could potentially create laws that negatively affect the observed community.

“The whole idea is if you do not use these technologies in concert with local communities and ensure that they are aware of not only what you are doing but why you are doing it, including data on their relatives, their ancestors and their culture, you’re going to potentially misrepresent things and harm these communities,” he said.

Davis added that archaeologists who are doing research in person in a community traditionally communicate with the community that they are observing and acquire the necessary permissions and legal forms. The principles of remote sensing are not codified the same way as in-person archaeology, and therefore, there are no ethical guidelines that pertain specifically to remote sensing.

“The whole idea is if you do not use these technologies in concert with local communities and ensure that they are aware of not only what you are doing but why you are doing it, including data on their relatives, their ancestors and their culture, you’re going to potentially misrepresent things and harm these communities.”

— Dylan Davis, doctoral student in archaeology, Penn State

Dani Buffa, a co-author on the paper and a doctoral student in the Olo Be Taloha Lab, said remote sensing can be particularly problematic in communities that recognize a sacredness in certain locales and limit visitation rights to or knowledge of that place to certain individuals. Researchers who use remotely sensed data should understand this may be deeply disturbing to some communities.

“In Madagascar, communities observe a wide variety of taboos, known as fady, to prevent physical harm to their families and community from angry spirits. Fady-regarding locations may prohibit access for all or just outsiders, and these rules are strict,” Buffa said. “Even if fady-like beliefs are not present in the community of interest, by not thinking about ethics, researchers risk betraying the trust of their partner community.”

Kristina Douglass, principal investigator for the Olo Be Taloha Lab, Joyce and Doug Sherwin Early Career Professor in the Rock Ethics Institute and assistant professor of anthropology and African studies at Penn State, said communities all around the world continue to fight for their autonomy and sovereignty over their territories, livelihoods and culture.

“Remote sensing technology is incredibly powerful, and because it can be used from afar, it is often thought of as non-invasive,” Douglass said. “As technologies become more and more sophisticated and powerful, we have a responsibility to recognize the ways in which their application may infringe on communities’ rights.”

“As technologies become more and more sophisticated and powerful, we have a responsibility to recognize the ways in which their application may infringe on communities’ rights.”

—Kristina Douglass, Joyce and Doug Sherwin Early Career Professor in the Rock Ethics Institute and assistant professor of anthropology and African studies

In addition to Davis, Buffa and Douglass, authors include Penn State researchers Tanambelo Rasolondrainy, Ebony Creswell, Chiamaka Anyanwu, Abiola Ibirogba, Clare Randolph and Abderrahim Ouarghidi. Not at Penn State are Leanne N. Phelps, School of GeoSciences, University of Edinburgh and Tropical Diversity, Royal Botanic Garden; François Lahiniriko, George Manahira and Zafy Maharesy Dieu Donné Chrisostome, Morombe Archaeological Project, Andavadoake, Madagascar.

The research team would like to remember Zafy Maharesy Dieu Donné Chrisostome, beloved colleague, team member and friend, who died suddenly in July 2021.

Please visit the site: <https://news.psu.edu/story/664265/2021/07/21/research/ethics-remote-sensing-archaeology>

STONE AGE AXE DATING BACK 1.3 MILLION YEARS UNEARTHED IN MOROCCO

Researchers find North Africa's oldest Stone Age hand-axe manufacturing site, dating back 1.3 million years.

Archaeologists in Morocco have announced the discovery of North Africa's oldest Stone Age hand-axe manufacturing site, dating back 1.3 million years, an international team reported on Wednesday.

The find pushes back by hundreds of thousands of years the start date in North Africa of the Acheulian stone tool industry associated with a key human ancestor, Homo erectus, researchers on the team told journalists in Rabat.

It was made during excavations at a quarry on the outskirts of the country's economic capital Casablanca.

This "major discovery ... contributes to enriching the debate on the emergence of the Acheulian in Africa", said Abderrahim Mohib, co-director of the Franco-Moroccan Prehistory of Casablanca programme.

Before the find, the presence in Morocco of the Acheulian stone tool industry was thought to date back 700,000 years.

New finds at the Thomas Quarry I site, first made famous in 1969 when a human half mandible was discovered in a cave, mean the Acheulian there is almost twice as old.

The 17-strong team behind the discovery comprised Moroccan, French and Italian researchers, and their finding is based on the study of stone tools extracted from the site.

Moroccan archaeologist Abdelouahed Ben Ncer called the news a "chronological rebound".

He said the beginning of the Acheulian in Morocco is now close to the South and East African start dates of 1.6 million and 1.8 million years ago respectively.

Earlier humans had made do with more primitive pebble tools, known as Oldowan after their East African type site.

'Richest Acheulean assemblages'

Research at the Casablanca site has been carried out for decades, and has "delivered one of the richest Acheulean assemblages in Africa", Mohib said.

"It is very important because we are talking about prehistoric time, a complex period for which little data exists."

Mohib said the study also made it possible to attest to “the oldest presence in Morocco of humans” who were “variants of Homo erectus”.

In 2017, the discovery of five fossils at Jebel Irhoud in Morocco, estimated at 300,000 years old, overturned evolutionary science when they were designated Homo sapiens.

The Moroccan fossils were much older than some with similar facial characteristics excavated from Omo Kibish in Ethiopia, dating back about 195,000 years.

Please visit the site: <https://www.aljazeera.com/news/2021/7/28/archaeologists-in-morocco-announce-major-stone-age-find> [Go there for pix]

ARCHAEOLOGISTS UNCOVER RARE "FAST GALLEY" FROM 2ND CENTURY BCE

Marine archaeologists have uncovered the wreck of an ancient Egyptian "fast galley," a rarely-found vessel class from the Ptolemaic period.

This particular wreck is significant for its location at the lost city of Heraklion, once Egypt's largest and most prosperous seaport. Like many ports, it faced stiff competition for shipowners' business, and it eventually lost ground to nearby Alexandria. The city disappeared into the sea between the first century B.C. and the eighth century AD, likely destroyed by earthquakes and then flooded due to land subsidence. The city's underwater ruins were spotted by an airplane pilot in 1933, and an archaeological team began studying the site 66 years later. So far, they've examined about five percent of the total, indicating the probability of more finds to come.

According to the European Institute for Underwater Archaeology, the craft was likely "hit by huge blocks from the famed temple of Amun, which was totally destroyed [in] a cataclysmic event in the second century B.C."

The 80-foot galley was built for speed with a narrow, shallow hull, and likely served as a warship. With a length to breadth ratio of 6-to-1 - approaching the length to breadth ratio of a modern Arleigh Burke-class destroyer - it would have been relatively fast on the water. Vessels of this kind were wind- and human-powered, with a tall mast and banks of oarsmen for propulsion.

The wreck rested about 15 feet below stone rubble and mud for two millennia before a team of archaeologists discovered it with a sub-bottom profiler. Time and sea life could have taken their toll on the structure, but the clay helped ensure its preservation.

According to the team, the ship mixes construction methods used by Egyptian and Greek shipbuilders - like Greek mortise-and-tenon joints.

Its shallow draft indicates that it was built for operations in the littorals of the Nile River and its delta.

Please visit the site: <https://maritime-executive.com/article/archaeologists-uncover-rare-fast-galley-from-2nd-century-bce> [Go there for pix]

RECONSTRUCTING A 12TH-CENTURY PIPE ORGAN DISCOVERED IN THE HOLY LAND, BY J-P MAURO

In the early 20th century, a team of archaeologists unearthed a 12th-century organ from beneath the Basilica of the Nativity in Bethlehem. The organ, which was preserved by the dry climate for centuries, is the oldest extant example of a pipe organ. Now, Spanish music historian and organist David Catalunya will attempt to reconstruct it so it might sound again.

To call the piece an organ is a bit of an exaggeration, as only the pipes and bells were recovered. The rest of the organ is traditionally constructed from wooden pieces that would not have survived. Still, these metal aerophones are the heart of the organ, which produce sound as air moves through the pipe.

Catalunya expressed his awe over the state of preservation the pipes were in. Although they seem to have oxidized a bit, there is little sign of rust or wear. Only a handful of the pipes shown in the video, featured above, show any sign of deterioration. Catalunya told Christian Media Center:

“The instrument is really like frozen in time ... these pipes could have been made yesterday. Here we have the opportunity to really understand much more about the medieval history of the organ, technology in general and Church culture. We also have the opportunity to understand how these instruments were made in order to replicate them and bring their sound alive again.”

Music history

He went on to explain that the organ was most likely brought to the Holy Land by French Crusaders. Catalunya speculates that the organ was used for about a century at the basilica. It was not until the Muslim invasion of the 12th century that the organ was removed for protection.

The study of the organ is expected to deepen our understanding of music history and Church music practices. Before this organ was discovered there were no examples of organs from before the 15th century. The oldest playable organ has about a dozen pipes that date to 1435.

Catalunya has begun the process of restoring and rebuilding the organ. The project is expected to last about 5 years and the goal is to hear the 12th-century organ sound once more. When it is fully restored, the historic instrument will be housed in the Terra Sancta Museum, in Jerusalem. There it will be on display as an exhibit and, hopefully, used in concerts.

Please visit the site: <https://aleteia.org/2021/07/24/reconstructing-a-12th-century-pipe-organ-discovered-in-the-holy-land/> [Go there for pix]

ARCHAEOLOGISTS FIND ANCIENT EGYPTIAN SHIPWRECK THAT SANK 2,200 YEARS AGO WHEN IT WAS HIT BY FALLING BLOCKS AS TEMPLE OF AMUN WAS DESTROYED BY A MASSIVE EARTHQUAKE, BY CHRIS CIACCIA

Archaeologists found an ancient shipwreck and funeral remains in the Mediterranean

The ship sank after it was hit with 'huge blocks' from the temple of Amun. It was discovered under the ancient city of Heracleion, off Egypt's north coast. Heracleion was lost around 800AD due to flooding and earthquakes.

The ship, known as a fast galley, is 82ft long and its body was built with a flat keel. It is one of two surviving vessels built like this: the other was discovered in 1971. Experts also found elaborate pottery and a gold amulet of the Egyptian god Bes.

Archaeologists have unearthed a 2,200 year-old shipwreck - along with the remains of a funerary area - in the Mediterranean sea that sank after it was hit with 'huge blocks' from the temple of Amun.

The wreck was discovered underneath the ancient city of Heracleion, which fell into the water after it was destroyed by earthquakes nearly 1,200 years ago.

Experts have noted that the ship, known as a fast galley, is 25 meters (82ft) long and its body was built with a flat keel, something that was common for navigating the Nile River and the Delta.

They also found a large sail and other evidence that 'the ship was built in Egypt,' according to a statement from the Egyptian Ministry of Tourism and Antiquities posted on Facebook.

Archaeologists have unearthed a 2,200 year-old shipwreck - along with the remains of a funerary area - in the Mediterranean sea that sank after it was hit with 'huge blocks' from the temple of Amun.

The ship sank 'as a result of the collapse of the temple and huge blocks falling on it during the second century BC, due to a devastating earthquake, the fall of these stone blocks contributed to keeping the ship down the deep canal now filled with temple debris,' the statement added.

The galley is under 5 meters (16ft) of clay on the seabed, along with debris from the temple.

The burial was also covered with a pile of rocks, a tumulus, that was used in ancient times to signify burials.

'This discovery beautifully illustrates the presence of the Greek merchants who lived in that city,' the ministry told Reuters, noting that Greeks also lived there during the late Pharaonic dynasties.

'They built their own sanctuaries close to the huge temple of Amun. Those were destroyed, simultaneously and their remains are found mixed with those of the Egyptian temple.'

Lead researcher and president of the European Institute for Underwater Archaeology Franck Goddio, said in a statement that the finds of fast galleys from this period are 'extremely rare.'

It is one of only two surviving vessels built in this manner: the first, the Marsala, built in 235 B.C., was discovered in 1971 in Sicily, according to Artnet.

The discovery of the wreck, along with the remains of a funerary area, was found using a new type of sonar.

Heracleion is believed to have been at the center of Mediterranean trade more than 1,000 years ago.

The city of Heracleion, home of the temple where Cleopatra was inaugurated, was one of the most important trade centers in the Mediterranean area before it disappeared into what is now the Bay of Aboukir.

Before Alexandria was founded by Alexander the Great in 331, Thônis-Heracleion was the largest port city in Egypt.

The city slumped into the sea some 1,200 years ago, around 800 A.D., likely due to a series of earthquakes that eventually pushed it into the sea.

Heracleion, sometimes known as Thônis-Heracleion (for the Egyptian and Greek names), was rediscovered by archaeologists and the European Institute for Underwater Archaeology near the turn of the 21st century and experts have been analyzing it ever since.

Some have given it the nickname 'Egypt's Atlantis.'

In 2019, archaeologists discovered the ruins of an underwater temple in the city, located off Egypt's north coast.

WHAT IS THE ANCIENT CITY OF HERACLEION?

Thonis-Heracleion (the Egyptian and Greek names of the city) is a city that sank 1,200 years ago.

Before the foundation of Alexandria in 331 BC, the city knew glorious times as the obligatory port of entry to Egypt for all ships coming from the Greek world.

It had also a religious importance because of the temple of Amun, which played an important role in rites associated with dynasty continuity.

The city was founded probably around the 8th century BC, underwent diverse natural catastrophes, and finally sunk entirely into the depths of the Mediterranean in the 8th century AD.

Prior to its discovery in 2000 by the European Institute for Underwater Archaeology (IEASM), directed by Franck Goddio, no trace of Thonis-Heracleion had been found.

Its name was almost razed from the memory of mankind, only preserved in ancient classic texts and rare inscriptions found on land by archaeologists. The Greek historian Herodotus (5th century BC) tells us of a great temple that was built where the famous hero Herakles first set foot on to Egypt.

He also reports of Helen's visit to Heracleion with her lover Paris before the Trojan War.

More than four centuries after Herodotus' visit to Egypt, the geographer Strabo observed that the city of Heracleion, which possessed the temple of Herakles, is located straight to the east of Canopus at the mouth of the Canopic branch of the River Nile.

Please visit the site: <https://www.dailymail.co.uk/sciencetech/article-9826579/Archaeologists-2-200-year-old-shipwreck-underwater-city-Egypt.html> [Go there for pix]

BENEATH ISTANBUL, ARCHAEOLOGISTS EXPLORE AN ANCIENT CITY'S BYZANTINE BASEMENTS, BY DURRIE BOUSCAREN

The winding streets of old Istanbul are an overlapping cacophony of seagulls, ship horns and vendors of colorful fresh fruit. Shady fig trees cluster near crumbling Byzantine walls and sweeping Ottoman palaces, remnants of the empires that conquered and lost this strategic point on the Bosphorus Strait, which formed the seat of the Eastern Roman Empire.

Underneath it all is an ancient world that's almost invisible, unless you know where to look.

"Can you imagine my excitement when I saw this for the first time?" exclaims archaeologist Ferudun Ozgumus, as he leads the way down a rickety wooden staircase into a cavernous structure deep beneath a carpet shop. "It was full of debris as far as that corner of the arch," he says, pointing across the space to a point 15 feet overhead. "We were crawling!"

As soon as you step inside the corridor of the carpet shop basement, the temperature drops. Arches, at least 20 feet high, are evenly spaced through the structure. Water drips from the ceiling, and as you look up, you see swirls of bricks — thin and rust-colored, alternating with thick stripes of mortar.

"The thickness of the bricks, the thickness of the mortar between the bricks and the color all tell me the date of the structure," Ozgumus explains. "You can see this arch, it's hewn stones, cut stones. This arch is older. I'm sure that this is from the 2nd century A.D."

This particular site, Ozgumus believes, may be related to a sprawling palace built by Constantine the Great, the 4th century Roman emperor and founder of ancient Constantinople. But it's hard to know for sure.

Many Byzantine-era buildings that are mentioned in archival documents have been lost to history, such as Constantine's famous palace reception hall. No one has ever found it.

"We have a lot of literary sources coming from the late-Roman time, but archaeological data doesn't match," Ozgumus says.

Ozgumus' working theory, based on the bricks and the shop's location, is that this structure may have been a storage basement underneath that palace reception hall. But this idea can only be confirmed by additional excavations.

"It's like another world, another city"

Throughout Istanbul, there are clues to how residents of the Byzantine capital lived, worked in and built their city. These blend in with the current surroundings: The ruins of an ancient Roman bathhouse frame the boiler room of a modern office building. A 6th

century cistern with blinding-white columns serves as a jewelers' workshop, with machinery to etch out silver necklaces and rings. ("The ventilation isn't great," says the owner, "but it stays warm in the winter and cool in the summer.") And the shell of a small church — reachable by ladder — sits beneath the basement of a hookah bar.

These sites form the basis of a small but growing line of underground tours, in which visitors can navigate narrow passages to see ancient brickwork, cisterns and frescoes from long-forgotten churches.

"There's no easy access to underground structures. They're privately owned, and you need a network," said Yasin Karabacak, an author and tour guide who shares his finds on social media as the "Hidden Face of Istanbul."

"Everyone can go to the Hagia Sophia. But when you open a door to the underground... you feel special, like it's only for you," Karabacak says. "It's like another world, another city."

The tunnels beneath Istanbul aren't all mysterious. There is no shortage of mythology surrounding Istanbul's underground world, said to be full of secret tunnels. It's believed that an emperor had secret tunnels built from his palace to both the Hagia Sophia and the Hippodrome (now Sultanahmet Square) so that he and his entourage could appear in public without entering the street.

When Christian crusaders sacked Constantinople during the Fourth Crusade in 1204, several artifacts from the Hagia Sophia went missing.

It would be logical that the church's monks could have hidden Christian relics in these secret tunnels, if they existed. But they have never been found.

Some tunnels — like those for the cleaning crews in the Ottoman-built aqueducts — simply served mundane purposes, Karabacak says.

"So not all tunnels are secret or have a secret function. They have a very basic function like cleaning, maintenance," he says.

Istanbul's Byzantine basement surfeit survives in part thanks to a 1980s cultural heritage code that allows people who find something ancient on their property to keep it, without worrying that the government will seize it.

"Thanks to this new law, a lot of historical things were protected by the locals in Istanbul," Ozgumus says. "Before, they were destroying it."

For some, the Roman ruins have attracted tourists and been a boon. The owner of one carpet shop, finding a cistern underneath it, converted the site into a small museum devoted to Constantinople's ancient Hippodrome. Another built his shop's foundation around a fallen column simply because it was too heavy to move.

Others still fear losing their property or having renovations delayed by historical surveys. Sometimes construction can be held up because of significant archeological finds. So they keep their property's ancient sites hidden, Ozgumus says.

Byzantine marvels include an earthquake-proof water storage system

Byzantine stonemasons were experts at building underground. They created an extensive system of cisterns to store water pulled in through aqueducts, and large basements under public buildings to provide temperature-controlled storage.

Kerim Altug, an archaeologist and architectural historian who works with the Istanbul Metropolitan Municipality, noticed that the cisterns were built with techniques that helped the city's water supply withstand earthquakes.

"The model consists of four columns, each connected with arches. Each square bay creates a cistern. And each is connected to another by wooden tie beams," Altug said. "It moves uniformly during the earthquake and never collapses."

Altug has mapped the location of 158 Byzantine cisterns, and believes there were thousands in ancient Constantinople.

"We don't know where we are on this work, because there are many other cisterns waiting to be discovered," Altug said. "There are no systematic archeological excavations. Most are rescue excavations for construction projects."

When the Ottomans arrived, it made sense for them to build over and reuse Byzantine structures, says historian Arzu Ulas, rather than demolishing them and starting from scratch.

"Materials used in the Byzantine empire were hard to find in wartime," she says. "It was very costly, and the Byzantine structures were very strong."

The Ottomans expanded and improved Constantinople's water system. They sometimes converted cisterns into silk weaving workshops and storage for fresh produce. Later, some substructures fell into disrepair or were used for illegal activities such as smuggling, Ulas says. Under some mosques, she's found corridors filled with water and animal bones.

Not everything should be excavated

In Istanbul's Fatih district, a balcony behind a wholesale leather distributor overlooks stone arches that Ferudun Ozgumus believes were built as part of a storage basement under a stately home on the Forum of Theodosius, Constantinople's main square. He believes this is a 6th century structure, based on its column capitals dating to the era of the Emperor Justinian.

Ozgumus points out two rectangular voids in the stone, the remnants of an ancient heating system which forced warm air through the belly of a building and into adjoining rooms.

These arches have survived centuries of earthquakes, fires and rapid urban development. Even today, they're still supporting the weight of the world above.

But in a jarring juxtaposition, 30-foot blue metal stilts are bolted into the stones, holding up the floor of a prefabricated shopping mall. A hatch in the mall's floor is used to dump trash — takeout boxes, scraps of wood, even a plastic store mannequin — onto the Byzantine structure below.

"Look at this. It's a shame on us," Ozgumus says. "In its heyday, it was beautiful."

It's a good example, he says, of why not all of Istanbul's underworld should be excavated. Too many archeological excavations were abandoned after the work was done, leaving sites vulnerable to developers.

"Those substructures are giving us the layout of the original Istanbul, from the time of the 4th century," Ozgumus says. "We're in the heart of the city now."

If you don't have the financing and a plan to preserve it, he believes, you should keep it in the ground.

Please visit the site: <https://www.npr.org/2021/07/23/1016814868/beneath-istanbul-archaeologists-explore-an-ancient-citys-byzantine-basements> [Go there for pix and audio]

OLDEST BRIDGE IN EUROPE STILL IN USE **FOUND IN GREECE,** **BY BELLA KONTOGIANNI**

Perhaps the oldest bridge in Europe that is still in use today can be found in Greece; named the Arkadiko Bridge, it dates back to Mycenaean times.

The Arkadiko Bridge, also named the Kazarma Bridge, is a Mycenaean construction which can be found in the southern region of mainland Greece, the Peloponnesian peninsula.

Oldest bridge in Europe still in use?

The bridge, which is located near the modern road from Tiryns to Epidauros in the Peloponnese, is still used very frequently today. The small arched bridge is still traversed by cars, although it is officially only endorsed for pedestrian use, and it is an important landmark and functional feature of the entire area.

The bridge dates back to Greece's Bronze Age, or around 1,300 BC. Originally, it was built to connect the ancient city of Epidauros with Mycenae, and was therefore part of a military road network.

However, what is perhaps the most interesting feature of the bridge is the way it was constructed. The bridge has remained standing and stable for thousands of years, but incredibly does not use any form of binder such as mortar. Not only the weight of the limestone, but also how symmetrically the blocks are placed on the vertical axis, makes the bridge stable.

This style of construction, which is called Cyclopean masonry, uses massive limestone boulders, roughly fitted together with very little space left between adjacent stones, and no mortar. The boulders typically seem unworked, but some may have been shaped roughly with a hammer and the gaps between boulders filled in with smaller chunks of limestone.

The most famous and well-known works using Cyclopean masonry can be found in Mycenae and Tiryns, where a large percentage of walls in these areas were built using this impressive technique.

Originally made for chariots

The bridge is 22 meters (72 feet) long, 5.6 meters (18 feet) wide, and 4 meters (13 feet) tall.

Although today it is mostly used by pedestrians, its original purpose was quite different. Archaeologists have discovered that, due to the bridge's style and the specific way it was built, it was originally meant for use by horse-drawn chariots.

The bridge would have been used to transport goods from place to place, but also would have been traversed by Greek troops on their travels across the country.

Although the Arkadiko Bridge may be the oldest bridge still in use in Europe, it is not unique in the wider area. In fact, it is one of four known Mycenaean corbel arch bridges near Arkadiko, all belonging to the same Bronze Age highway between the two cities, and all of similar design and age.

A video of the Arkadiko Bridge, perhaps the oldest bridge in Europe that is still in use, can be found below:

https://www.youtube.com/watch?v=jslBa1il_H0&feature=emb_logo

Please visit the site: https://greekreporter.com/2021/07/29/greece-home-oldest-bridge-europe-still-use/?fbclid=IwAR06Lig_6WVXPCixqLZuDjBiyugHdZeN9z6tBh-7LjC2Yfa5nGZpPRCPX4
