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Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Σεπτέμβριος 2021 -

**What you leave behind is not what is engraved in
stone monuments, but what is woven into the lives
of others.**
(Pericles)

Newsletter of the Hellenic Society of Archaeometry

- September 2021 -

Nr. 246

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ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

CONFERENCE ON CULTURAL HERITAGE AND NEW TECHNOLOGIES: THE WORLD'S HERITAGE IN THE DIGITAL AGE, NEW TECHNOLOGIES TOWARDS SUSTAINABLE RESEARCH, CONSERVATION AND COMMUNICATION, NOVEMBER, 2-4 2021, VIENNA, AUSTRIA

After 25 years of successful management of the CHNT by Stadtarchäologie Vienna, the organization of the conference is under a new management. From 2021 onwards, the conference on Cultural Heritage and New Technologies will be organized by CHNT-ICOMOS Austria, a branch association of the Austrian National Committee of ICOMOS. All cultural heritage is part of the World's Heritage. The World Heritage Convention provides a clear framework for the conservation of sites on the World Heritage List. In this way many innovations are developed in particular for the research, conservation and communication of those sites. Still there are many challenging tasks that can be met with innovative technologies and new interdisciplinary methods.

The conference aims to bring together international scientists from all over the world who are involved in research, conservation and management of the world's cultural heritage. Innovative measuring, data management and processing tools are requested as well as the methods and approaches for the research, management and monitoring of sites and objects.

Latest NEWS

The Call for Papers, Short papers, Posters, Apps and Science Slam is open until **August 20, 2021**:

- Submission for Papers, Short papers, Posters - <https://www.chnt.at/submission-for-papers-short-papers-posters/>
- Submission for AppAward - <https://www.chnt.at/submissions-for-app-award/>
- Submission for Science Slam - <https://www.chnt.at/submission-for-science-slam/>

We are waiting for your submission!

For regular information please sign up [CHNT Newsletter](#) or visit us on [Facebook](#), [Twitter](#) and [LinkedIn](#). If you have further questions, please do not hesitate to contact office@icomos.at.

Sincerely

Irmengard Mayer
Secretary General

ICOMOS Austria

PS: Inform your colleagues about [CHNT 26, 2021](#)!



SIXTH INTERNATIONAL CONFERENCE
HELIKE VI, HELIKE AFTER 373 BC, AN
INTERDISCIPLINARY APPROACH, 4-6
SEPTEMBER 2021, CULTURAL CENTER OF
AIGION

ORGANIZER: THE HELIKE SOCIETY

SPONSORS

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ΤΕΤΡΑΜΥΘΟΣ

ΔΕΥΤΕΡΑ, 6 ΣΕΠΤΕΜΒΡΙΟΥ - MONDAY, SEPTEMBER 6

09.30 Γεωαρχαιολογική ξενάγηση στην περιοχή Αρχαίας Ελίκης
Geoarchaeological Tour in the major Helike area
11.30 Επίσκεψη στον αρχαιολογικό χώρο Αρχαίας Ελίκης
Visit to the archaeological site of Ancient Helike
Αποχαιρετιστήριο γεύμα - Farewell meal

ΟΡΓΑΝΩΤΙΚΗ ΕΠΙΤΡΟΠΗ - ORGANIZING COMMITTEE

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Πρόεδρος Εταιρείας Φίλων της Αρχαίας Ελίκης & Διευθύντρια
Ερευνητικού Προγράμματος Αρχαίας Ελίκης
President of the Helike Society & Director of the Helike Project

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Μαρία Καρβέλα
Γενική Γραμματέας Εταιρείας Φίλων της Αρχαίας Ελίκης
Secretary General of the Helike Society

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S.E.N. Heritage Looms, Athens
Julia Sysalova
Ινστιτούτο Μεσογειακού Πολιτισμού
Institute of the Mediterranean Culture

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ΠΡΟΕΔΡΟΣ - PRESIDENT

Ντόρα Κατσωνοπούλου

Πρόεδρος Εταιρείας Φίλων της Αρχαίας Ελίκης & Διευθύντρια

Ερευνητικού Προγράμματος Αρχαίας Ελίκης

President of the Helike Society & Director of the Helike Project

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Professor of Archaeology, University of Messina, Italy

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Πανεπιστήμιο Αθηνών

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Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης

Associate Professor of Geology, Department of Geology, Aristotle University

ΣΑΒΒΑΤΟ, 4 ΣΕΠΤΕΜΒΡΙΟΥ - SATURDAY, SEPTEMBER 4

Πολιτιστικό Κέντρο Δήμου Αιγιαλείας, Αΐγιον (Παλιό Νοσοκομείο)

18.30 Εγγραφή - Registration

19.00 Χαιρετισμοί / Έναρξη Συνεδρίου

Greetings / Opening ceremony

Εναρκτήρια Συνεδρία 1 - Opening Session 1

Προεδρείο - Chair: Λίλιαν Καραλή

19.30 Ιωάννης Κουκούβελας και Ντόρα Κατσωνοπούλου

373 π.Χ. Ένας ασυνήθιστος συνδυασμός φυσικών καταστροφών

19.55 Ντόρα Κατσωνοπούλου και Έλενα Παρτίδα

Η Αναγέννηση της Ελίκης μετά το 373 π.Χ.

20.20 Σοφία Τσουρινάκη

Δίκτυο βαφείων στον Κορινθιακό Κόλπο κατά την Ελληνιστική περίοδο

Συζήτηση - Discussion 15'

Εγκαίνια Έκθεσης & Δράσεις Πειραματικής Αρχαιολογίας

Opening of Experimental Archaeology Exhibition

Δεξίωση της Εταιρείας Φίλων της Αρχαίας Ελίκης

Reception by the Helike Society

ΚΥΡΙΑΚΗ, 5 ΣΕΠΤΕΜΒΡΙΟΥ - SUNDAY, SEPTEMBER 5

Πολιτιστικό Κέντρο Δήμου Αιγιαλείας, Αΐγιον (Παλιό Νοσοκομείο)

2η Συνεδρία - Session 2

Προεδρείο - Chair: Χρήστος Μεράτζας – Κωνσταντίνος Κλάγκος

09.00 Βάγια Ξανθοπούλου, Ιωάννης Ηλιόπουλος, Ντόρα Κατσωνοπούλου

Πετρογραφικός και γεωχημικός χαρακτηρισμός των αποθηκευτικών πύλων από την Ελληνιστική Ελίκη (θέση Ρωμανός): Προκαταρκτικά αποτελέσματα

09.20 Χριστίνα τρουμπούκη και Γιώργος Φακορέλλης

Φυσικοχημική μελέτη κονιαμάτων, κεραμικών και άλλων ευρημάτων από το ελληνιστικό εργαστήριο βαφής υφασμάτων στην Αρχαία Ελίκη

09.40 Γεωργία Πετράτου κ.ά.

Μικροσκοπική εξέταση εξανθρακωμάτων Ελληνιστικής εποχής από την Αρχαία Ελίκη

10.00 Λίλιαν Καραλή

Το φυσικό περιβάλλον και τα κατάλοιπα μαλακίων από την Ελίκη κατά την Ελληνιστική περίοδο

10.20 Γεώργιος Κατσιάνης και Γεώργιος Ηλιόπουλος

Οστεολογική ανάλυση οστών θηλαστικών από την Αρχαία Ελίκη

Συζήτηση - Discussion 15'

Διάλειμμα - Coffee break

3η Συνεδρία - Session 3

Προεδρείο - Chair: Ιωάννης Κουκούβελας – Μαρία Καρβέλα

11.30 Γεράσιμος Παπαδόπουλος και Ιωάννα Τριανταφύλλου

Το Τσουνάμι που προκλήθηκε από τον σεισμό της Ελίκης το 373 π.Χ.: Μια επανεξέταση

11.50 Amanda Gaggioli

Soil Micromorphological Investigation of Hellenistic Helike (Romanos site): The Discovery of Soft Sediment Deformation Structures (SSDS)

12.10 Ελένη Κολαΐτη και Νίκος Μουρτζάς

Μεταβολές του επιπέδου της θάλασσας στη νοτιοδυτική ακτή του Κορινθιακού Κόλπου (ΒΔ Πελοπόννησος)

12.30 Ντόρα Κατσωνοπούλου

Ένας άγνωστος σεισμός της Ύστερης Αρχαιότητας στην Ρωμαϊκή Ελίκη

12.50 Λίλιαν Καραλή και - Αναστασία Τσαλίκη

Θάνατος από σεισμό στην Ρωμαϊκή Ελίκη

13.10 Sandra Garvie-Lok

Life and Death in Ancient Helike: Insights from the Human Remains

Συζήτηση - Discussion 20'

Γεύμα – Lunch

4η Συνεδρία - Session 4

Προεδρείο - Chair: Ντόρα Κατσωνοπούλου – Γιώργος Φακορέλλης

16.10 Χρήστος Μεράντζας

Σκέψεις για την ανασκαφική «οντοφάνεια» στην Αρχαία Ελίκη

16.30 Robert Weir

Was Helike a Typical Hellenistic Polis?: A Comparative Study of Numismatic Contexts

16.50 Σοφία τσουρινάκη

Τεντώνοντας τα νήματα: Μεθοδολογικές προσεγγίσεις των υφαντικών εργαλείων στην Ελίκη κατά την Ελληνιστική περίοδο

17.10 Κωνσταντίνος Κιούσης

Το έργο συντήρησης αρχαιολογικών ευρημάτων από την Αρχαία Ελίκη

17.30 Mariza Kormann και Dora Katsonopoulou

Exploring the Use of GNSS in Land Survey of the Helike Delta with Point Cloud Data Visualization and Analysis of Hellenistic Structures

17.50 Κωνσταντίνος Νικολακόπουλος και Ιωάννης Κουκούβελας

Η σημασία των πλεονεκτημάτων της τηλεπισκόπησης στην μελέτη αρχαιολογικών χώρων: Το παράδειγμα της Ελληνιστικής Ελίκης

Συζήτηση - Discussion 20'

Διάλειμμα - Coffee break

19.00 Τελικά Συμπεράσματα - Final Conclusions

Ντόρα Κατσωνοπούλου, Ιωάννης Κουκούβελας, Γεράσιμος Παπαδόπουλος

Επίσκεψη στο Μουσείο Ιστορίας και Λαογραφίας Λόγγου

Visit to the History and Folklore Museum of Longos

Δείπνο - Dinner

Ελληνικόν Ειδύλλιον, Σελιανίτικα

3RD INTERNATIONAL CONGRESS ON ARCHAEOLOGICAL SCIENCES IN THE EASTERN MEDITERRANEAN AND THE MIDDLE EAST, 14 TO 18 MARCH 2022, CYPRUS INSTITUTE, 1ST CIRCULAR

Dear colleagues,

After a successful ICAS-EMME 2 in November 2019 The Science and Technology in Archaeology and Culture Research Center (STARC) of the [Cyprus Institute](#) is pleased to announce the dates for the 3rd *International Congress on Archaeological Sciences in the Eastern Mediterranean and the Middle East* (ICAS-EMME 3). The congress will be hosted at the Cyprus Institute from **14 to 18 March 2022**, co-organised by [STARC](#), [CAARI \(Cyprus American Archaeological Research Institute\)](#) and the [ARU \(Archaeological Research Unit, University of Cyprus\)](#).

This international congress aims to highlight recent advances in natural, material and computational science applications to archaeology and cultural heritage in the Eastern Mediterranean and the Middle East, and to provide an international academic forum for dissemination of results of current research in these fields in the region. The congress is addressed to the international scientific community of archaeologists, archaeological & heritage scientists, and researchers applying natural, material and computational science methods to archaeology and cultural heritage in the Eastern Mediterranean and the Middle East.

Sessions within the congress will include the following:

- An Environmental History of ancient Cyprus: landscapes, plants and animals through time
- Mediterranean palaeomobility: written sources, material networks and skeletal data
- Copper metallurgy in the EMME
- Scientific Analysis of Ancient Glass in EMME region
- Interdisciplinary ceramic studies as proxies for approaching Eastern Mediterranean societies of the 2nd and 1st millennia BC
- Potting traditions of medieval and post-medieval Eastern Mediterranean
- Art Characterization
- Digital documentation of heritage and the participation of local communities
- Multimodal Digital Heritage Preservation in the EMME Region
- Modelling Settlement Transformations in the EMME region
- Graduate Research in Archaeological Sciences in the EMME region
- Challenges and opportunities in Graduate Research in EMME region (round table)

Congress remit: Papers (podium or poster presentations) **on all aspects of research using natural, material and computational science applications to archaeology and**

cultural heritage in the Eastern Mediterranean and the Middle East are welcome. Problem oriented case studies, comparative studies, as well as papers addressing advances, problems and potential on regional and local scales are welcome. The geographical scope of the workshop is inclusive, encompassing the Eastern Mediterranean and the Balkans, the Middle East including Egypt and Libya, and Southwest Asia including Iran and the Gulf. The chronological scope ranges from the earliest prehistory to medieval and historical periods.

As with ICAS-EMME 2, we plan to *publish the proceedings as a Special Issue in a renowned academic peer reviewed journal* (<https://icasemme.cyi.ac.cy/proceedings-icasemme2>).

For further information and regular updates please visit the conference website and follow us on the conference social media accounts (tba) or just email us:
www.icasemme.cyi.ac.cy
icasamme@cyi.ac.cy

On behalf of the Organizing Committee

Artemios Oikonomou

VIII INTERNATIONAL CONFERENCE ON MAMMOTHS AND THEIR RELATIVES, 25-28 OCTOBER 2021, INDIAN INSTITUTE OF SCIENCE, BANGALORE, INDIA

We are happy to warmly welcome you to the VIII International Conference on Mammoths and their Relatives to be held from 25th to 28th October 2021 being organized by the Indian Institute of Science, Bangalore, India. This conference will now be held as a “split conference” with an online session in October 2021 and a field trip-cum-mini-conference during 2022 (when travel restrictions imposed due to the ongoing Covid-19 pandemic eases). During each of the four days of the scientific conference in October 2021, there will be a 3-hour session held at the most convenient time for participants from across the world to participate live.

The themes of the conference include Evolution & Biogeography, Genetics (ancient and modern), Ecology (ancient and modern), Extinction (ancient), Conservation (modern), Archaeozoology, and Others. You can opt for a preference of Oral or Poster presentations. Please follow the link on this website’s home page or the main menu to submit your abstracts. We shall offer one or more exciting field trips during 2022 to see free-ranging Asian elephants in Bandipur National Park (Karnataka, India) and Corbett National Park (Uttarakhand, India) and also to explore the famous Neogene-Quaternary vertebrate fossil site of the Siwaliks (Punjab, India).

Registration and submission of abstracts will be open by the second half of August 2021. As this is an online conference, the registration rates will be kept at a modest level with discounted rates for students, nationals of SAARC countries, and participants from low-income countries. The indicative rates are provided in the conference website but may be further reduced in case we are able to raise additional funding from sponsors.

We have constituted a National Organizing Committee as well an International Steering Committee to guide us in organizing and conducting the conference.

Alpcord India has been contracted to develop the web portal and handle the logistical arrangements for this online conference. Please feel free to inform your colleagues and friends of this conference. We look forward to finally seeing you online later this year!

Co-organizers:

Prof. Raman Sukumar (Centre for Ecological Sciences, Indian Institute of Science, Bangalore, India).

Prof. Rajeev Patnaik (Centre for Advanced Study in Geology, Punjab University, Chandigarh, India).

Important Dates

Main Conference hosted online by Indian Institute of Science 25th - 28th October 2021

<i>Registration Open</i>	23 rd August 2021
<i>Abstract Submission</i>	OPEN!
<i>Deadline of Abstract Submission</i>	26th September for Oral Presentations 17th October for Poster Presentations
<i>Notification of Abstract Acceptance</i>	5th October for Oral Presentations In general most Poster Presentations will be accepted

		
ΟΡΓΑΝΩΤΙΚΗ ΕΠΙΤΡΟΠΗ ΣΥΝΕΔΡΙΟΥ ΕΛΛΑΔΑ www.euromed-dch.eu	 4^ο Πανελλήνιο Συνέδριο Ψηφιοποίησης Πολιτιστικής Κληρονομιάς - EUROMED 2021	

ΑΘΗΝΑ, ΑΥΓΟΥΣΤΟΣ 2021

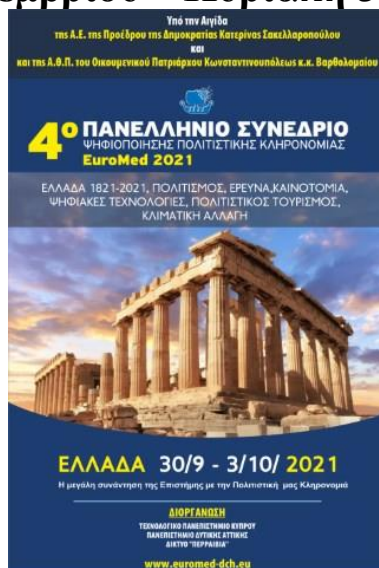
ΠΡΟΣΚΛΗΣΗ ΔΩΡΕΑΝ ΣΥΜΜΕΤΟΧΗΣ

**στο 4ο Πανελλήνιο Συνέδριο Ψηφιοποίησης
Πολιτιστικής Κληρονομιάς 2021**

4th Pan-Hellenic Conference on Digital Cultural Heritage-EuroMed 2021),

ΜΕΣΩ ΔΙΑΔΙΚΤΥΟΥ-WEB CONFERENCE

Πέμπτη 30 Σεπτεμβρίου – Κυριακή 3 Οκτωβρίου 2021



**Το Συνέδριο τελεί υπό την Αιγίδα
της Προέδρου της Ελληνικής Δημοκρατίας
και του Οικουμενικού Πατριάρχου Κωνσταντινουπόλεως**

**Η μεγάλη συνάντηση των Νέων Τεχνολογιών με την Πολιτιστική
Κληρονομία
Πολιτισμός, Παιδεία, Νέες Τεχνολογίες, Καινοτομία, Τουρισμός,
Κλιματική Αλλαγή**

Όλες οι λεπτομέρειες στο Link www.euromed-dch.eu

Προθεσμία ΔΩΡΕΑΝ εγγραφής Συνέδρων μέχρι τις 27/9/2021

Αγαπητοί Συνεργάτες και Συνάδελφοι,

Έχουμε την χαρά και την τιμή να σας προσκαλέσουμε να συμμετάσχετε στο 4ο ΠΑΝΕΛΛΗΝΙΟ ΣΥΝΕΔΡΙΟ ΨΗΦΙΟΠΟΙΗΣΗΣ ΠΟΛΙΤΙΣΤΙΚΗΣ ΚΛΗΡΟΝΟΜΙΑΣ-EuroMed 2021, που, φέτος, θα γίνει ΔΙΑΔΙΚΤΥΑΚΑ και που έχει θεσμοθετηθεί και διοργανώνεται στην Ελλάδα κάθε δύο (2) χρόνια, μετά από απόφαση των διοργανωτών Φορέων, που είναι:

- το Τεχνολογικό Πανεπιστήμιο Κύπρου (ΤΕ.ΠΑ.Κ.- Εργαστήριο Ψηφιακής Πολιτιστικής Κληρονομιάς(UNESCO Chair on Digital Cultural Heritage και EU-ERA Chair on Digital Cultural Heritage) ,
- το Πανεπιστήμιο Δυτικής Αττικής (ΘΕΣΜΟΘΕΤΗΜΕΝΟ ΕΡΓΑΣΤΗΡΙΟ Μη – Καταστροφικών Ελέγχων και Μεθοδολογιών Διάγνωσης Συστημάτων (NDT-SD Lab), του Τμήματος Μηχανικών Βιομηχανικής Σχεδίασης και Παραγωγής της Σχολής Μηχανικών) και
- ο Πολιτιστικός Οργανισμός "Δίκτυο ΠΕΡΡΑΙΒΙΑ" (Εργαστήριο Ψηφιοποίησης Πολιτιστικής Κληρονομιάς).

Θα πρέπει να τονίσουμε ότι τα μοναδικά αυτά Συνέδρια, που λόγω της θεματολογίας τους, χαρακτηρίστηκαν από όλους ως πρωτοπόρα και καινοτόμα, αλλά και ως εθνικής σημασίας, συγκεντρώνουν το ενδιαφέρον όλου του Ελληνισμού (εντός και εκτός Ελλάδος) και τελούν υπό την Αιγίδα της ΑΕ της Προέδρου της Ελληνικής Δημοκρατίας Κατερίνας Σακελλαροπούλου και της Α.Θ. Παναγιώτης του Οικουμενικού Πατριάρχου Κωνσταντινουπόλεως κ.κ. Βαρθολομαίου, ενώ έχουν και την υποστήριξη του Υπουργείου Ψηφιακής Διακυβέρνησης, του Υπουργείου Πολιτισμού και Αθλητισμού του Υπουργείου Τουρισμού , της Εκκλησίας της Ελλάδος, του Ελληνικού Οργανισμού Τουρισμού, της Κυπριακής Πρεσβείας στην Ελλάδα ,του Πανεπιστημίου Θεσσαλίας και πολλών παγκόσμιων επιστημονικών Οργανισμών (ICOMOS, ICOM, UNESCO, Ε.Ε. κ.ά.).

Στα πλαίσια του 4ου Πανελλήνιου Συνεδρίου προσκαλείται όλη η επιστημονική και ερευνητική κοινότητα, από την Ελλάδα και την Κύπρο, αλλά και Έλληνες και Κύπριοι ερευνητές ανά την υφήλιο, να δηλώσουν συμμετοχή τους ως Σύνεδροι, αλλά και ως εισηγητές, υποβάλλοντας τις εισηγήσεις και τα Posters τους, μέσω της επίσημης ιστοσελίδας του Συνεδρίου www.euromed-dch.eu

Επίκαιρα θέματα στο μικροσκόπιο της Επιστήμης

Οι θεματικοί άξονες που θα αναλυθούν, μέσα από περίπου 100 επιστημονικές εργασίες, που υπάρχει η χρονική δυνατότητα να παρουσιαστούν στο 4ήμερο Συνέδριο, είναι οι ακόλουθοι:

1. Ελλάδα 1821-2021: 200 Χρόνια Ελευθερίας - Τιμώντας την Ιστορία χτίζουμε την Ελλάδα του 21^{ου} αιώνα
2. Τρισδιάστατη απεικόνιση και Εκτύπωση -Νέες τεχνολογίες στις ανθρωπιστικές επιστήμες
3. Ψηφιοποίηση στην Αρχαιολογία και ανάδειξη της πολιτιστικής κληρονομιάς στο ψηφιακό πολυμεσικό περιβάλλον και διαδίκτυο (Εκπαίδευση κ.ά.)
4. Πολιτιστικός και Θρησκευτικός Τουρισμός-Ψηφιακή Πολιτιστική κληρονομιά και η διαχείριση της
5. Κλιματική Αλλαγή - Συντήρηση, Προστασία Πολιτιστικών αγαθών
6. Μουσεία, Βιβλιοθήκες και Ψηφιακές Τεχνολογίες
7. Εμπειρίες, Νέες Προκλήσεις και Προοπτικές για την ψηφιακή κοινωνία της Πολιτιστικής Κληρονομιάς-Πόροι και χρηματοδοτικά εργαλεία.
8. Τοπική Αυτοδιοίκηση και Πολιτιστική Κληρονομιά- Δημιουργία έξυπνων Πόλεων μέσα από τον Πολιτισμό-Κόμβοι Καινοτομίας –Βιομηχανική Αρχαιολογία
9. Δημιουργική Βιομηχανία και επιχειρηματικές ευκαιρίες στον Πολιτισμό

Key Note Speakers

Αξίζει να σημειωθεί, ότι λόγω των σημαντικών θεμάτων που το Συνέδριο αυτό εξετάζει, πέρα από τον επετειακό χαρακτήρα των 200 ετών Ελευθερίας, έχουν προκληθεί σημαντικές προσωπικότητες ως Key Note Speakers, όπως είναι ο τ. Πρόεδρος της Δημοκρατίας κ. Προκόπιος Παυλόπουλος, η Πρόεδρος του «Ελλάδα 2021» κ. Γιάννα Αγγελοπούλου, οι καθηγητές πανεπιστημίου κ.κ. Κώστας Καρτάλης, Νίκος Ζαχαριάς, Σπύρος Συρόπουλος, η διευθύντρια του ΕΚΤ κ. Εύη Σαχίνη, ο κ. Δημ. Παπαστεργίου, πρόεδρος της ΚΕΔΕ, ενώ αναμένονται και απαντήσεις αρμόδιων υπουργείων και παγκόσμιων επιστημονικών οργανισμών.

Όλοι οι συμμετέχοντες θα λάβουν ΒΕΒΑΙΩΣΗ ΣΥΜΜΕΤΟΧΗΣ.

Η εγγραφή των Συνέδρων μπορεί να γίνει ON LINE μέχρι και 27/9/2021, στο παρακάτω LINK

<http://conf.euromed-dch.eu/backend/enroll/el>,

από την οποία θα ενημερώνεστε για όλες τις εξελίξεις.

Σας ενημερώνουμε ότι το Συνέδριο θα πραγματοποιηθεί διαδικτυακά και θα δοθούν προς όλους τους συνέδρους, έγκαιρα, όλες οι οδηγίες για τον τρόπο σύνδεσής τους με το Συνέδριο.

ΠΛΗΡΟΦΟΡΙΕΣ για τα προηγούμενα συνέδρια στην Ελλάδα στα εξής Links:

www.euromed2017.eu,

www.euromed-dch.eu



**Πανελλήνιο Συνέδριο
Ψηφιοποίησης Πολιτιστικής
Κληρονομιάς**

**Πανελλήνια Συνέδρια Ψηφιοποίησης Πολιτιστικής
Κληρονομιάς**

Pan-Hellenic Conference on Digital Cultural Heritage- EuroMed

**Πολιτισμός, παιδεία, έρευνα, καινοτομία, ψηφιακές τεχνολογίες,
τουρισμός**

Η Οργανωτική Επιτροπή

MARINOS ΙΩΑΝΝΙΔΗΣ -Καθηγητής Τεχνολογικού Πανεπιστημίου Κύπρου-ΤΕΠΑΚ

ΘΕΟΔ. ΓΚΑΝΕΤΣΟΣ- Καθηγητής Πανεπιστημίου Δυτικής Αττικής

ΙΩΑΝΝΗΣ ΒΑΡΑΛΗΣ –Αναπλ. Καθηγητής Πανεπιστημίου Θεσσαλίας,

ΗΛΙΑΣ ΝΟΜΠΛΑΚΗΣ - τ. Αν. Καθηγητής Πανεπιστημίου Δυτικής Αττικής,

ΚΩΝ/ΝΟΣ ΣΚΡΙΑΠΑΣ -Οικονομολόγος -Σύμβουλος Ανάπτυξης –Πρόεδρος Δικτύου "ΠΕΡΡΑΙΒΙΑ" - Ελλάδα

Πληροφορίες για το συνέδριο μπορείτε να αντλήσετε από την επίσημη ιστοσελίδα:

<http://euromed-dch.eu>,

ενώ για συνεννοήσεις που αφορούν οργανωτικά θέματα με τον κ. Κων. Σκριάπα, Πρόεδρο Δικτύου "ΠΕΡΡΑΙΒΙΑ", στο τηλ. 6974-881944, E-Mail:euromed.greece@gmail.com

LINK για την εγγραφή συνέδρων: <http://conf.euromed-dch.eu/backend/enroll/el>

HMS RESEARCH IN PROGRESS MEETING **2021, SATURDAY 13TH NOVEMBER,** **MOESGAARD MUSEUM, AARHUS,** **DENMARK**

This year's Research in Progress Meeting 2021 will take place on Saturday the 13th November, hosted by Moesgaard Museum (Aarhus, Denmark), though practically will take place as a virtual online event. We would like to invite all members, students, curators, researchers, metallurgists, commercial archaeologists, to attend the online event. We would like to invite submissions for oral presentations, poster presentations, as well as the opportunity to create a pre-recorded multi-media visual mini-digest presentation – this might take the form of interlacing video footage with dialogue, results and illustrations/pictures (even with music!). The aim is to take advantage of the digital event and make it more stimulating for participants, presenters and viewers. For regular presentations, we would recommend an average of 15 minutes (with time for questions added), though please feel free to request less/more time if you need when submitting an abstract. For Poster's, there is the option to deliver a short accompanying oral presentation of several minutes. We encourage those who wish to be creative to take-up the multi-media pre-recorded mini presentations to do so.

Abstracts (no longer than 250 words) and specification of presentation type (oral, poster, media digest) should be submitted to Thomas Birch (teb@moesgaardmuseum.dk) – if you do not receive a confirmation of receipt, please reach out using the HMS website contact. There will be an HMS prize for the best student presentation (oral/poster/media) as per previous meetings.

We look forward to seeing you in November! Further details will be circulated in advance of the meeting (would aim to start at 9 am GMT).

Thomas Birch
HMS Council

teb@moesgaardmuseum.dk

ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ –
JOB VACANCIES/FELLOWSHIPS

HISTORIC ENGLAND AND ENGLISH
HERITAGE CALL FOR COLLABORATIVE
DOCTORAL RESEARCH PARTNERSHIPS

Historic England and English Heritage are delighted to announce our 2021 Call for Proposals for our AHRC funded Collaborative Doctoral Partnership (CDP) programme. The CDP programme provides funding for collaborative PhD studentship projects which support the work of our organisations.

Studentship proposals should be submitted by a university based researcher in collaboration with a named member of staff from Historic England or English Heritage, who will act as co-supervisor. We are not looking for project ideas directly from potential students.

Proposals must match one of our published CDP Priority Research Areas 2021 and we encourage a range of proposals across these areas that can demonstrate academic originality, are appropriate for collaborative study at doctoral level, and fall within the AHRC subject remit. Proposals must also demonstrate that they can provide career development opportunities for the student outside of their main research within the funded 4 year period.

Of particular interest to this list is that the priority areas for this call includes a theme on the conservation of ruined masonry.

The deadline for proposals is 5.00pm on Friday 26th November 2021.

More details are available at the Historic England website:
<https://historicengland.org.uk/research/support-and-collaboration/researchopportunities/collaborative-doctoral/>

PHD IN SCIENCE AND TECHNOLOGY IN ARCHAEOLOGY AND CULTURAL HERITAGE: RECONSTRUCTING THE CHAINE OPERATOIRE OF EARLY MIEVEAL COPPER METALLURGY IN SOUTHERN MOROCCO

The Cyprus Institute offers a fully funded 3-year doctoral position with the above research project, based at the Graduate School of the Cyprus Institute and at the [Science and Technology in Archaeology and Culture Research Center](#) (STARC) of The Cyprus Institute (CyI). The primary supervisor will be [Thilo Rehren](#), A.G. Leventis Professor of Archaeological Sciences at CyI. The position is open for applicants of all nationalities.

The successful applicant will be admitted to the PhD programme Science & Technology in Archaeology and Cultural Heritage of the Cyprus Institute. The researcher will be expected to analyse a range of metallurgical material, including crucibles, slag and some metal, both raw and finished objects. Most of the research will be conducted at STARC using a suite of already-collected material, but the successful applicant is expected to travel to southern Morocco, probably in early 2023, for a month-long field season as part of a team led by colleagues from the l'Institut National des Sciences de l'Archéologie et du Patrimoine (INSAP), Morocco, and the British Museum, UK. The selected candidate for this project is expected to conduct sample selection and documentation in Morocco, sample preparation and analytical work using optical and electron microscopy at STARC, and cooperate with external laboratories for other analytical work, such as trace element and stable heavy isotope analyses. A background in mineralogy and / or process technology in metallurgical systems will be highly advantageous.

The Cyprus Institute (CyI) is a young and rapidly growing non-profit research and educational institution with scientific and technological focus. It is supported by the Government of Cyprus, which views its establishment as important to its overall policy of transforming Cyprus into a regional center for research and education. The Graduate School was established in 2010 and is the educational arm of The Cyprus Institute. It is a fully accredited, degree-granting institution of higher education offering exclusively postgraduate programs. It maintains a small number of students that are fully integrated into the research activities of the institute. This provides the students with the opportunity to acquire hands-on training in the use of the latest methods and techniques, have access to state-of-the-art infrastructure and conduct research with internationally recognized research teams. The [Science and Technology in Archaeology and Culture Research Center](#) of the CyI is devoted to the development, introduction and use of advanced science and technologies in the field of archaeology, cultural heritage and history of the region.

The successful candidate is expected to have a Master's degree in earth or material sciences, or in archaeology with emphasis on science-based material culture studies, heritage science or a related field. For the particular research requirements of this

fellowship, a Bachelor's degree and/or a Master's degree in mineralogy or related inorganic materials science will be a strong advantage. Good oral and written communication skills in English and the ability to work in an international, interdisciplinary research environment are considered essential skills; knowledge of French will be an advantage. Applicants should follow the [application process for a PhD in Science & Technology in Archaeology & Cultural Heritage at the Cyprus Institute](#).

Kindly note that applications should be sent through the [online application system](#) of The Cyprus Institute Graduate School. When applying through the online application, in Step 2 of the application under the section 'Scholarship or Financial Aid', applicants should select 'Specific PhD Project' and they should enter the project reference code: GS-ACH-21-8 in the Project Code field. Applicants should also mention in their statement of intent that they are applying for the PhD position with reference code: GS-ACH-21-8. If the code is not entered in the online application, the applicant may not be considered for this position. The successful candidate will be employed as Graduate Research Assistant or receive a stipend in accordance with the current regulations at the Graduate School. The exact salary / stipend level will be confirmed upon appointment. Tuition fees will be covered by the project.

The Graduate School has regular deadlines for applications, with the main one for this position being the 15th September 2021 to allow sufficient time for the visa application process for non-EU citizens. The position will be advertised until filled.

For general information about the position, please contact the project PI, Professor Thilo Rehren (th.rehren@cyi.ac.cy). For more information about postgraduate studies at The Cyprus Institute and admission requirements, please contact the Office of Graduate Studies of The Cyprus Institute at office.school@cyi.ac.cy or at tel: +357 22208614.

CALL FOR AN OPEN PH.D POSOTION IN THE FIELD OF ARCHAEO MATERIALS

The Track in Archaeomaterials and Conservation Sciences (BGU-TACS) at the department of archeology, Ben Gurion University of the Negev (Israel), calls on those with a master's degree in archeology and/or one of the relevant fields mentioned below, to study for a doctorate combining archeology and analytical research of ancient technologies. *The appropriate candidate will receive a scholarship for the entire period of study (Ph.D.).*

The candidate will conduct research led by a senior faculty member from Ben Gurion University of the Negev and a senior researcher from the Israel Antiquities Authority, in the field of **the beginning of metal production in the ancient Near East**. The research combines scientific fieldwork in archeological excavations (operation of analytical field laboratories) and in the laboratory of archaeological sciences at the Israel Antiquities Authority, as well as at the micro-archeology laboratory and the institute for nanoscale science and technology at Ben-Gurion University of the Negev. In addition, the selected candidate will be sent to study research methods in advanced university laboratories in Italy.

Prerequisites: Degree in archeology and (with high priority) also a degree in one of the following fields: geology, materials engineering or mechanical engineering, chemistry, physics, geography, or other relevant fields.

Candidates are asked to contact Prof. Yuval Goren by email with a resume and a list of publications by **September 20th, 2021** at: ygoren@bgu.ac.il

Any questions should be directed to Yuval at the same e-mail address.

Sincerely,

Yarden Pagelson

PhD candidate, Track in Archaeomaterials and Conservation Sciences (TACS)
Department of Archaeology, Ben Gurion University of the Negev

RESEARCH ASSOCIATE / RESEARCH SPECIALIST, US-MA-WOODS HOLE

Job ID
2021-1502
Category
Science/Research
Type
regular
Location : Location
US-MA-Woods Hole

Job Summary

The National Ocean Sciences Accelerator Mass Spectrometry (NOSAMS) facility at the Woods Hole Oceanographic Institution (WHOI) is seeking a **Research Associate or Research Specialist** for the maintenance, development, and operation of two ¹⁴C Accelerator Mass Spectrometry (AMS) systems. This is a regular, full-time, exempt position and is eligible for full benefits.

The first AMS system is based upon a 500 kV Pelletron accelerator and incorporates both a conventional graphite sputter source and a unique, gas-accepting, microwave ion source. The second AMS system is based upon a 2.5 MV Tandem. The Tandem system is scheduled to be retired in 2022 to be replaced by a Mini Carbon Dating System (MiCaDaS) currently under construction at Ionplus AG. The new MiCaDaS system comes with several sample-to-gas-to ion source interfaces to allow enhanced NOSAMS capabilities and unique research directions.

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

The internal working title for this position could be either *Research Associate III* or *Research Specialist*. The final level of the position will be determined commensurate with the selected candidate's level of education & experience.

Essential Functions

ESSENTIAL FUNCTIONS

- Works independently to maintain and operate an ¹⁴C AMS system.
- Practices judgment and creativity in making adaptations or modifications to instrumentation and laboratory methods.

- Exercises technical responsibility for organizing and interpreting required collected data.
- May supervise technical staff personnel within the facility.
- Develops important techniques and designs that improve NOSAMS capabilities.
- Writes peer-reviewed publications and presents research results at national and international scientific meetings.

Education & Experience

A Ph.D. is desirable. However, a Masters or B.S. degree with extensive relevant work experience is acceptable. Prior experience with operating and troubleshooting complex systems related to accelerator mass spectrometry would be valuable. Some high-level language programming (Visual Basic, SQL) and experience with CAD and equipment control software (LabVIEW) are desirable. Ability to work with a diverse group, interact with scientific community, schedule and prioritize tasks, and independently handle a broad range of research activities is essential. Weekend and after hours work is to be expected.

RESEARCH ASSOCIATE II/III

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

RESEARCH SPECIALIST (minimum requirements)

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

Special Requirements

Please visit <http://careers.who.edu/> and respond to Job ID 2021-1502. Applicants should upload to the appropriate application fields a cover letter, curriculum vitae (CV), two-page statement of research interests and career goals, names of four references (please include in your cover letter or add a new cover letter labeled respectively), and copies of up to three relevant publications. Information on NOSAMS can be found at: <https://www2.who.edu/site/nosams/>

The review of applications will begin around August 16, 2021

Physical Requirements

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

[Apply for this job online](#)

[Email this job to a friend](#)

Share on your newsfeed

WHOI is an Affirmative Action/Equal Opportunity Employer/Disabled/Veterans/M/F. We encourage Veterans and those with Disabilities to apply. Applications are reviewed confidentially. Applicants that require accommodation in the job application process are encouraged to contact us at (508) 289-2253 or email eeo@whoi.edu for assistance.

Please visit the site: <https://careers-whoicims.com/jobs/1502/research-associate---research-specialist/job?mobile=false&width=1020&height=500&bga=true&needsRedirect=false&jan1offset=120&jun1offset=180>

RADIOCARBON SCIENTIST - GNS SCIENCE, **TE PŪ AO, NEW ZEALAND**

GNS Science, Te Pū Ao, occupies a unique place in New Zealand's science landscape. We have a strong heritage of producing world-leading earth, geoscience and isotope research. This, coupled with people who are passionate and committed, means we are more focused than ever before on bringing our vision of a cleaner, safer, more prosperous New Zealand to life.

We are seeking a highly motivated early career scientist to support our Rafter Radiocarbon Laboratory operations. The successful candidate will bring radiocarbon expertise in a discipline aligned with GNS Science's research strategy, including but not limited to: atmospheric science, groundwater, oceanography, Antarctic science, paleo-climatology, paleo-hazards. The position will be split between day-to-day support for sample preparation and accelerator mass spectrometry operations and radiocarbon data quality, and scientific research in radiocarbon applications development.

The successful candidate will work within our Rafter Radiocarbon Laboratory research team of scientists and technical staff. There will be opportunities to link with other researchers within GNS, nationally and internationally through new and ongoing radiocarbon-focussed research projects.

You will have:

- A PhD in a relevant physical science with a focus on radiocarbon
- Strong expertise in radiocarbon development and/or applications
- An understanding of accelerator mass spectrometry
- The ability to interpret and clearly communicate scientific data and results through written papers and oral presentations
- Competence in one or more scientific programming languages

Details and application instructions at:

<https://careers.sciencenewzealand.org/jobdetails/ajid/Qntj9/Radiocarbon-Scientist,44167.html>

Please contact Dr Jocelyn Turnbull J.Turnbull@gns.cri.nz with any questions or queries.

Jocelyn Turnbull

Radiocarbon Science Leader

IG3IS co-chair

GNS Science Te Pū Ao ^[L]_[SEP]

30 Gracefield Rd, Gracefield 5010, PO Box 31312, Lower Hutt 5040, New Zealand

Ph +64 4 570 4726 **Mob** +64 21 149 0598

Email: j.turnbull@gns.cri.nz

CFA: GRANT ANNOUNCEMENT FOR PHD CANDIDATES- OPEN TO GLOBAL APPLICATIONS

I would like to circulate the message that Scrintal and PhDVoice sponsor a US\$500 grant to be awarded to one PhD student and the application period is open. This grant is intended to support a PhD student financially for the upcoming year. The grant is multi-purpose and can be used for any study-related expense, including but not limited to conference or workshop expenses, living and travel costs during studies, etc.

Important Dates

The applications close on September 15th (2021) and the grant is awarded on October 1st (2021).

Who can apply?

All PhD students (2021/2022) can apply, regardless of the study field and affiliated institution.

Selection criteria

The selection criteria are based on the creative and unique presentation of one's PhD topic and a solid plan on how to use the grant.

For more information and application please refer to this link:
<https://phdvoice.org/phd-voice-scholarship/>

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

ΧΡΙΣΤΙΑΝΙΚΗ ΑΡΧΑΙΟΛΟΓΙΚΗ ΕΤΑΙΡΕΙΑ / CHRISTIAN ARCHAEOLOGICAL SOCIETY - SCIENTIFIC SOCIETY FOR THE STUDY OF BYZANTINE AND POST - BYZANTINE ARCHAEOLOGY AND ART, FOUNDED IN 1884, CALL FOR PAPERS, *DELTION OF THE CHRISTIAN ARCHAEOLOGICAL SOCIETY (DCHAE) 43 (2022) DEDICATED TO THE MEMORY OF CYRIL A. MANGO*

NEW Deadline for submissions: **Sunday, October 24, 2021**

As already known the eminent Byzantinist Cyril A. Mango passed away on the 8th of February, 2021. The Board of the Christian Archaeological Society (ChAE), of which he was an honorary member, acknowledging his enormous contribution to Byzantine Studies has decided to honour him by dedicating to his memory the 43rd volume of the *Deltion of the Christian Archaeological Society/DChAE* (2022). Greek and foreign archaeologists and historians of Byzantine art and architecture are invited to contribute to the volume with original studies related to the Early Christian and Byzantine periods (300-1453). Due to Cyril Mango's multi-faceted activity as a scholar, historians and philologists are also invited to contribute to the volume with original studies related to the history of art. As with previous honorary volumes, submissions should not exceed the **5,000 words** (text and footnotes) and contain no more than **eight photographs and drawings/plans**.

In accordance with the editorial guidelines of the *Deltion of the ChAE*, each submission will be evaluated for approval by two anonymous reviewers designated by the Society's Board.

Papers submitted for consideration should be prepared following the ***Guidelines for Authors***:

<http://ejournals.epublishing.ekt.gr/index.php/deltion/about/submissions#authorGuidelines>

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

The submitted file must include in the following order **(a)** the title of the paper, **(b)** an abstract of max. 80 words, **(c)** at least four keywords indicating the *period*, the *place*,

general and *specific subject* and finally the *site* and the *monument*, encompassed by the paper, **(d)** the text with footnotes, **(e)** a summary of ca. 1,000 words, **(f)** the list of the Figures with subtitles and their provenance/copyrights. At the end of the file, the illustrations in law resolution must be included (one figure in each page). In case that the language of the paper is other than the English, all the above information (a, b, c) must be in English.

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

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

Authors who have not yet made their subscription to the electronic platform of the *Deltion of the ChAE* must do it following the instructions in the link below:

<https://ejournals.epublishing.ekt.gr/index.php/deltion/user/register>

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INTERNET SITES

A COFFIN IS UNEARTHED USING ANCIENT EGYPTIAN TECH

Archaeologists in Saqqara make a dazzling discovery: a late period Egyptian coffin with a gilded mask. Now, to bring it to the surface, they use a pulley known as a "tambora," a technology that dates back to Ancient Egypt.

Please visit the site: <https://www.smithsonianmag.com/videos/category/history/a-coffin-is-unearthed-using-ancient-egyptian/> is this brief (3:52) video

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

REVEALING ANCIENT GOLD PARTING WITH SILVER AND COPPER ISOTOPES: IMPLICATIONS FROM CEMENTATION EXPERIMENTS AND FOR THE ANALYSIS OF GOLD ARTEFACTS

Daniel Berger & Michael Brauns & Gerhard Brüggemann & Ernst Pernicka & Nicole Lockhoff

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Archaeological and Anthropological Sciences (2021) 13:143
<https://doi.org/10.1007/s12520-021-01369-2>

Abstract

Gold parting enabled the production of very pure gold for various purposes from the sixth century BC onwards, but analytical proof of this pyrotechnical process is difficult. We describe a new analytical approach for the identification of purified gold combining silver and copper isotopic with trace element analyses. Parting experiments were performed with gold-silver-copper alloys using the classical salt cementation process to investigate potential silver and copper isotope fractionation and changes in trace element concentrations. In addition, we provide the first comprehensive dataset of silver isotope ratios of archaeological gold objects from the Mediterranean and Central Europe to test whether or not gold refining can be identified on the basis of isotope systematics. The results show that very heavy silver and copper isotopic compositions are clear evidence for parted gold, but that the application of copper isotopes might be limited.

Keywords: Gold parting . Cementation . Gold . Stable silver isotopes . Stable copper isotopes . Roman era . Prehistory . Mediterranean . Central Europe

Please visit the site: https://link.springer.com/epdf/10.1007/s12520-021-01369-2?sharing_token=Lqc1TI09rEImdgRUoYsuSPe4RwlQNchNBvi7wbcMAY5mFSJwtdcODScZulZMB0aIOASLm-4Uf7ugjgmw9WJNOrxtsRS4MEjgbmdMoD_v01P5zw-K9Nb_Z0HCuRVWQUakHZPWdBPnpGhkrL4OyQU6meQjC_K9ppHroZI-EiOfyOw%3D

TOWARD THE IDENTIFICATION OF SOCIAL SIGNATURES IN CERAMIC PRODUCTION – AN ARCHAEOLOGICAL CASE STUDY

Ortal Harush & Leore Grosman

Abstract

Ceramic analysis has been concerned with categorizing types according to vessel shape and size for describing a given material culture at a particular time. This analysis' long tradition has enabled archaeologists to define cultural units across time. However, going into the analysis of sub-typological variations is rarely done, although their meanings bear significant consequences on the understanding of ties between individuals and social units. This study, aiming to assess whether it is possible to identify social signatures, focuses on a single archaeological ceramic type. For this propose, we selected a corpus of 235 storage jars from two distinct

periods: storage jars from the Intermediate Bronze Age (the 25th -20th century BCE); and the Oval Storage Jar type (hereafter: OSJ) from the Iron Age II (the late 9th–early 6th century BCE). The vessels selected were 3-D scanned to extract accurate geometric parameters and analyzed through an advanced shape analysis.

The study results show that integrating computational and objective analysis methods, focusing on the “minute variation” within a single ceramic type, yields substantial insights regarding the relationship between variability and social units. In addition to the methodological guidelines and the suggested “work protocol” for further studies, the results shed light on the social organization of the Intermediate Bronze Age and the Iron Age II in Southern Levant.

Please visit the site:

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0254766> is this article. [Go there for download]

THE JOURNAL OF COMPUTER APPLICATIONS IN ARCHAEOLOGY (JCAA), VOLUME 4 - ISSUE 1 - 2021

The Journal of Computer Applications in Archaeology (JCAA) is a peer-reviewed, open access, electronic journal, featuring papers in all the disciplines related to digital archaeology, including but not limited to 3D modelling, spatial analysis, remote sensing, geophysics, field recording techniques, databases, semantic web, statistics, data mining, simulation modelling, network analysis and digital reconstructions of the past. The journal welcomes papers reporting original research, as well as papers that critically reflect on the use and impact of digital technologies in archaeology.

Research Article

Combined Detection and Segmentation of Archeological Structures from LiDAR Data Using a Deep Learning Approach Alexandre Guyot, Marc Lennon, Thierry Lorho, Laurence Hubert-Moy

Building a Model to Reconstruct the Hellenistic and Roman Road Networks of the Eastern Desert of Egypt, a Semi-Empirical Approach Based on Modern Travelers' Itineraries Louis Manière, Maël Crépy, Bérangère Redon

Interferometric SAR and Machine Learning: Using Open Source Data to Detect Archaeological Looting and Destruction Hassan El Hajj Special Collection: Fighting illicit trade in antiquities with digital technology

Digital Modelling in Museum and Private Collections: A Case Study on Early Italic Armour Joshua James Emmitt, Timothy Mackrell, Jeremy Armstrong Special Collection: Fighting illicit trade in antiquities with digital technology

Automatic Extraction and Labelling of Memorial Objects From 3D Point Clouds Nicholas Arnold, Plamen Angelov, Tim Viney, Peter Atkinson

An Explorative Application of Random Forest Algorithm for Archaeological Predictive Modeling. A Swiss Case Study Maria Elena Castiello, Marj Tonini

Remote and Close Range Sensing for the Automatic Identification and Characterization of Archaeological Looting. The Case of Peru Nicola Masini, Rosa Lasaponara Special Collection: Fighting illicit trade in antiquities with digital technology

Identifying Local Learning Communities During the Terminal Palaeolithic in the Southern Levant: Multi-scale 3-D Analysis of Flint Cores Francesco Valletta, Itamar Dag, Leore Grosman

It Is Not against the Law, if No-One Can See You: Online Social Organisation of Artefact-Hunting in Former Yugoslavia Samuel Andrew Hardy Special Collection: Fighting illicit trade in antiquities with digital technology

Position Paper

Theoretical Repositioning of Automated Remote Sensing Archaeology: Shifting from Features to Ephemeral Landscapes Dylan Davis

Please visit the site : <https://journal.caa-international.org/> [Go there for link to download and for earlier issues]



**NEW APPROACHES TO ANCIENT
MATERIAL CULTURE IN THE GREEK AND
ROMAN WORLD: 21ST-CENTURY METHODS
AND CLASSICAL ANTIQUITY,
BY CATHERINE COOPER**

Monumenta Graeca et Romana, volume 27.

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BMCR 2021.08.29

Review by Seth Pevnick, Cleveland Museum of Art. spevnick@clevelandart.org
[Authors and titles are listed at the end of the review.]

This edited volume, based on a 2015 University of Winnipeg conference, *Methodologies in Ancient Material Culture*, brings together an introduction and nine contributions demonstrating a wide range of approaches to material culture produced between the Late Bronze Age and the Late Antique period. While some of the papers originated as conference presentations, others were specially commissioned by the editor, C.L. Cooper. All stem from larger research projects, most with one or more previous publications, though plenty of new material and novel approaches are included.

Innovation, of course, has long figured in the interdisciplinary history of Classical Archaeology, presented from its origins by Cooper in her extensive introduction. After brief discussions of earlier periods, she gives more attention to the 20th and 21st centuries, aiming with this volume “to encourage interdisciplinarity and to reunite the separate strands of the discipline” (11). She then describes six types of approaches to ancient material culture—Contextual, Interconnected, Experiential, Technological, Multi-Scalar, and Revisionist—referencing both recently published examples and chapters within the current volume (each of which adopts multiple approaches).

Anna Collar (Chapter 1) demonstrates the growing utility for classical archaeologists of the terms “networks” and “interconnectivity,” now so prevalent in daily discourse. After first defining essential terms—Network, Social Network Analysis (SNA), Scale-Free Network, Proximal-Point Analysis (PPA), and Actor-Network Theory (ANT)—she explores their application, both within studies of the ancient Mediterranean world and in important philosophical, sociological, and anthropological work. A second section addresses potential challenges to network analysis, particularly connected with methodology, data, and scales of analysis. Clearly written and amply referenced, this chapter underscores how much ancient relationships matter.

Surprisingly, it includes no diagrams, maps, or images, which might have helped to illustrate certain types of complex relationships discussed (though the diligent reader can find many sources for clarification in the ample bibliography).

Sarah Murray (Chapter 2) examines how data analytics can aid archaeologists working with large datasets (or “big data,” even if small by comparison to corporate databases), especially to help offset the often-disproportionate influence of relatively few “big dig” sites. After surveying potential benefits and pitfalls of big data analytics, she presents a case study from the Late Bronze to Early Iron Age (EIA) transition in Greece. This comprises a geodatabase with some 4000 data points, each representing a component of a site with documented remains from the Late Bronze IIIB, Late Bronze IIIC, Protogeometric, or Geometric period, plus an accompanying bibliographic database with 800 digitized publications covering the same chronological periods. From these datasets, Murray has addressed numerous archaeological and historiographical questions, some previously published elsewhere. Perhaps most notably here, she shows how settlement patterns changed differently between mainland Greece and Crete, “with the mainland seeing a movement toward the coast in the Protogeometric period, and Crete seeing a movement inland” (71).

Additionally, a “nearest neighbour analysis” confirms a mainland EIA depopulation, with Protogeometric sites both less numerous and more sparsely distributed than those of LHIIIB.

Cooper (Chapter 3) scrutinizes a chryselephantine figurine in the Royal Ontario Museum (ROM) in Toronto, using the object biography approach.[1] This strategy works particularly well for certain museum items, since their collection and public display often constitute a sort of “afterlife” creating additional levels of meaning, even without archaeological findspot or context information.[2] On the basis of several 2013-14 ROM blog posts, Cooper details the figurine’s modern history, beginning with its unprovenanced 1930 sale by antiquities dealer/professor Charles Seltman. The preeminent Minoan archaeologist Sir Arthur Evans soon published it as “Our Lady of Sports,” or the Minoan Great Goddess as Bull-Leaper, precisely in line with his conception of Minoan religion. Despite doubts from other experts, for decades the figurine remained on view, a source of pride for the museum. Only in 2005, as similar statuettes elsewhere were shown to be modern fakes, was the ROM figurine finally removed from display. But two divergent characterizations of the object remain plausible today, even after more recent scientific and art historical studies—either a Bronze Age antiquity with modern restorations and enhancements, or a 20th-century creation made in the vision of Evans’ Minoan civilization. Cooper’s accomplishment lies in showing how the figurine retains value in either case.

Philip Sapirstein (Chapter 4) uses experimental archaeology in a case study of the Protocorinthian roof-tiling system of the Archaic “Old Temple” at Corinth (ca. 675-650 BCE). Following close analysis of hundreds of tile fragments, together with ethnographic analogy, he replicated several tiles. Here, he elaborates on his previously published reconstruction and hypothetical ten-step manufacturing sequence with more details on the time and labor entailed in their production. Sapirstein’s model estimates about 4,250 craftsperson-hours—or 80 working days for a team of four workers and a donkey—to produce the 2,000 tiles needed for the whole roof, plus additional time for planning and production of tools, molds, and kiln.

The entire temple would have required much more labor, with a low estimate—if modestly decorated—of at least 25,000 hours. Even this number, however, pales in comparison to the massive amounts of labor required for other large-scale ancient monuments, and the Old Temple “should be understood as ‘monumentally scaled’

primarily in comparison with the smaller shrines built of perishable materials in previous generations” (119).

David Saunders, Karen Trentelman, and Jeffrey Maish (Chapter 5) represent a diverse team of researchers collaborating on the Athenian Pottery Project to explain production processes of Athenian black- and red-figure pottery, particularly its characteristic black gloss.[3] Using previously unavailable technology, they present three brief case studies, each somehow questioning the widely accepted production procedure (a single, three-stage firing of vases made and decorated with similarly sourced iron-rich clay). In Case Study 1, two different methods of spectroscopy suggested that the same clay was used for potting and painting, but with the addition of zinc to the slip (perhaps as vitriol, a zinc-rich byproduct of metal mining). Case Study 2 measured the elemental composition and morphology of relief line, contour line, and black-gloss background on a single Kleophrades Painter fragment. Despite compositional similarities, the relief line showed more melting, suggesting two firings—first with relief line alone, then with additional decoration. Case Study 3 looked at black gloss and an underlying layer of red gloss on a different (and very unusual) fragment, again finding structural differences suggesting two separate episodes of painting and firing. Although small in sample size (due to expense and the need for removing and consuming minute quantities of ancient material), these results are remarkable, countering a nearly century-old understanding of Athenian pottery production. Next steps will require developing non-invasive and less costly techniques for expanding similar studies to significantly larger bodies of material.

Moving from Greece to Rome and from ceramics to glass, Nicola Barham takes her title “Everything Impossible” (Chapter 6) from a passage in the *Metamorphoses* of Apuleius (2.19), where beautiful glassware sits alongside cups crafted from gold, silver, and other expensive materials. Seeking to correct perceptions of mass-produced ancient glass objects as relatively common and inexpensive in antiquity, she applies a data-mining technique to online databases of ancient Greek and Roman texts. Through analysis of references to the medium of glass (found primarily by searches for the stems *vitr-*, *ύαλ-*, and *ύελ-*), she notes that glass appears frequently in high-value contexts, from architecture to personal adornment and fine glassware. Multiple authors also speak of the wondrous qualities of glass, whether in magnifying, glittering, transmitting, or reflecting light. Thus, Barham closes by praising the curatorial strategy of spotlighting exquisite ancient Roman glass—also shown in some of her illustrations—as not only attractive today, but also in accordance with ancient aesthetic values.

Dimitri Nakassis, Kevin Pluta, and Julie Hruby (Chapter 7) present their work on the Pylos Tablets Digital Project (PTDP), launched in 2013 with the goal of publishing all surviving Linear B tablets from the “Palace of Nestor” in a digital format. Inscribed while wet with administrative texts in the earliest known form of written Greek, the clay tablets were fortuitously preserved by the palace-destroying fire of ca. 1180 BCE. Traditional publications present the tablets, usually leaf- or page-shaped, primarily as textual documents, using transcriptions, line drawings, and black-and-white photographs. By augmenting these publication methods with Reflectance Transformation Imaging (RTI), a form of computational photography, the PTDP produces files that can be published online and provide a viewing experience much closer to autopsy. Additionally, three-dimensional scanning together with macroscopic analysis and X-Ray Fluorescence (XRF) increase understanding of the tablets as material objects, not simply texts. The

illustrations in this chapter suggest great promise, raising questions about when the PTDP files will become digitally available.

Sarah Blake and Jennifer Dyer (Chapter 8) interpret ancient material culture by applying object-oriented theoretical approaches to classical literature. After first introducing Bill Brown's Thing Theory, they briefly discuss Object-Oriented Ontology and "the unknowability of objects" (174). Next, turning to armor and weapons in texts, they demonstrate another side of object biographies (already familiar from Ch. 3). Homeric objects, such as the silver bowl awarded to Odysseus by Achilles for his victory in the footrace at the funeral games of Patroklos, for example, or the arms of Achilles, often play large roles, "as markers of time, as objects of exchange within social networks, and as co-participants in the warrior-figure" (176). For Vergil, similarly, Homeric-style objects carry special meaning—especially arms and armor, as indicated from the opening words of his epic, *arma virumque*. But rather than a clear duality of material things and human agents, Blake and Dyer show how this phrase encourages a deeper reading of the inhuman world, with "its agential networks of relations in which things, objects, and subjects participate meaningfully" (180).

Öhrman (Chapter 9) combines experimental archaeology with comparative textual analysis to uncover numerous instances of poetic sound-mimicking related to Roman textile production. After introducing evidence for warp-weighted and two-beam looms in the Roman world, she describes her weaving trials using recreated looms and tools. Spectrograms from video and audio recordings show distinct patterns associated with three main "soundmarks" of weaving, present on both loom types: shed change, beating of weft with weaving sword, and insertion of weft thread. Importantly, based on sounds, only the presence of tinkling or clanging loom weights can indicate the use of a warp-weighted rather than two-beam loom; an author might also mention this sound, or indicate the loom type by specifying the direction in which the weave grows, or how the warp is fixed to the loom. Four case studies follow, showing elements of weaving soundscapes in poetic descriptions ranging from Tibullus in the Augustan period to a Late Antique riddle.

Two Indexes (Ancient Sources and General) close the volume, each thorough and helpful, but with numerous cross-references necessitated by strict adherence to *Monumenta Graeca et Romana* style for ancient names (e.g., *Korinthos* for Corinth, *Ovidius* for Ovid). Separate bibliographies follow each chapter, convenient for readers but also sometimes repetitive. Illustrations, where included, are finely reproduced, some in color. In sum, this volume deserves a place in every major research library, where readers from a wide range of specialties will find several essays of interest. One only wonders, looking back at terms like "New Archaeology" and "New Art History," which of the New Approaches presented here will have the greatest impact on the future of Classical Archaeology.

Authors and Titles

C.L. Cooper (Kate Cooper), Introduction: Old and New Approaches to Ancient Material Culture

Part 1, Adopting Approaches

Anna Collar, Networks, Connectivity, and Material Culture Sarah Murray, Big Data and Greek Archaeology: Potential, Hazards, and a Case Study from Early Greece C.L. Cooper (Kate Cooper), Biography of the Bull-Leaper: A 'Minoan' Ivory Figurine and Collecting Antiquity

Part 2, Material Approaches

Philip Sapirstein, Labour Organization and Energetics of Early Archaic Architecture in Korinthos David Saunders, Karen Trentelman, and Jeffrey Maish, Collaborative Investigations in the Production of Athenian Pottery Nicola Barham, "Everything Impossible": Admiring Glass in Ancient Rome

Part 3, 'Reading' Material

Dimitri Nakassis, Kevin Pluta, and Julie Hruby, The Pylos Tablets Digital Project: Prehistoric Scripts in the 21st Century Sarah Blake and Jennifer Dyer, Objects and Things in Classical Literature Magdalena Öhrman, The Soundscape of Textile Work in the Roman World: Old Sources & New Methods

Notes

[1] Registration number 931.21.1 (pp. 84, 212), not 1931.21.1 (p. 77) – one of very few typos I found in the volume.

[2] For similar approaches to other museum objects, see now Object Biographies: Collaborative Approaches to Ancient Mediterranean Art.

Eds. John North Hopkins, Sarah Kielt Costello, and Paul Ramey Davis. Houston: Menil Collection, 2021 (too recently published for reference in the present volume).

[3] Athenian Pottery Project – The Getty Conservation Institute. A note in the interest of transparency: I invited Saunders to present some of these results in a 2016 lecture at the Tampa Museum of Art (as indicated on p. 124, n. 1). I was not involved in the research.

Please visit the site: <https://bmcr.brynmawr.edu/2021/2021.08.29/>

ΕΙΔΗΣΕΙΣ - NEWS RELEASE

ARCHAEOLOGISTS ARE SEEING CAVE ART IN A NEW LIGHT, BY BRIDGET ALEX

Prehistoric people may have created ‘proto-cinema,’ with galloping bison and tail-swishing horses.

Spain

A SMALL GROUP OF ARTISTS, carrying engraving tools, torches, and other supplies, assembled at the base of the towering limestone outcrop, near the mouth of a dark cave. Together, they entered the lightless space. For 40 minutes they wormed through passages and scrambled over speleothems. Their juniper-branch torches cast a warm, flickering light and shed bits of charcoal like bread crumbs along the trail.

Nearly a quarter-mile from the cave entrance, they reached their canvas: a rugged limestone wall, 40 feet long and eight feet above the cave floor. They set the torches aside, lit stone lamps greased with marrow, and climbed onto a ledge that ran along the wall’s base.

There, they began their work. At this spot in what’s now northern Spain’s Atxurra Cave, some 12,500 years ago, the artists carved scores of horses, bison, deer, and mountain goats. The animals’ outlines fluttered and winked in the light thrown by the lamps.

In 2015, two scientists rediscovered this masterpiece, now known as the Ledge of Horses, along with dozens of other carvings and paintings in other hard-to-reach corners of Atxurra Cave. Faded by time, some figures had nearly vanished. Researchers flooded the chambers with LED lights and took photographs, which they ran through software to detect elements not visible to human eyes. They recreated the art in digital form, allowing the modern world to behold it.

A technical achievement, yes, but the ancient artists never saw their works in the static, white light of electric bulbs, or via computer screens. As researchers continue to discover engravings and paintings deep underground, they also want to understand how—and why—past people made and viewed the images. Now, new experiments are providing important insights on the logistics of creating ancient cave art, and perhaps a glimmer of the intent behind it.

Roughly 38,000 years ago, Paleolithic people in Western Europe began braving dark caves to create some of humanity’s earliest art. Famous sites in present-day France and Spain, including Lascaux and Altamira, feature stunning geometric designs, handprints, and paintings of Ice Age beasts up to 17 feet in length. In a 36,000-year-old scene in Chauvet cave, lions grimace and pant as they chase a herd of bison.

Such cave art has long puzzled researchers: These works were concealed in darkness, and probably viewed by an occult few, yet the figures took considerable time and technical mastery to render. Why would Paleolithic people, already occupied with finding food and

other necessities, devote precious time and energy to creating art hidden hundreds of feet from daylight?

“The debates are huge. And everybody has these great arguments and all sorts of interesting things to say about it,” says archaeologist Holley Moyes, an expert on subterranean rituals and professor at the University of California, Merced.

Over the years, archaeologists have proposed that Paleolithic societies created the art as part of hunting rituals or psychedelic drug trips, or as historical records, teaching devices, or graphic novels, where a series of panels conveyed a continuous narrative. In some caves, animals or parts of their bodies are rendered several times, juxtaposed or superimposed in different positions. The light and shadows thrown by flames may have created the illusion that these figures were moving, according to some researchers, who call this art form “proto-cinema.” At Chauvet for example, the painting of an eight-legged bison might have appeared, by torchlight, to be a four-legged animal striding across the wall.

Marc Azéma, an archaeologist and filmmaker, made this case in his book *La préhistoire du cinéma* [The Prehistory of the Cinema]. In 12 French caves, Azéma identified more than 50 animal figures that might have been drawn to look as if they were galloping, tossing their heads, or swishing their tails.

“The flickering light, the dancing shadows, the warm glow from the fire, many people have argued that this creates a sense of theater, that you’re looking at an ancient version of cinema,” says University of Victoria archaeologist April Nowell.

Nowell and colleagues have designed electric lamps to emit light with the same color, intensity, and flicker as Paleolithic flame lamps. The research is ongoing, but Nowell was awestruck when they tested the devices in Koonalda Cave, Australia. There, after a “terrifying” climb up a 260-foot slope, they gazed upon a wall as long as a football field that was covered with streaks and swirls made at least 20,000 years ago.

Then they shut off their conventional lights and switched on the flame mimicking lamps. Nowell still marvels at the effect: “I don’t even know how to put it into words.” The lamps “gave this feeling of intimacy and warmth in the cave that is just missing with our modern technology.”

Scientists don’t use actual flaming torches in archaeological sites because soot could damage artifacts and other material. So, while some researchers develop devices that mimic ancient torches and lamps, others test their hypotheses in caves that don’t have archaeological remains. For example, Iñaki Intxaurbe, a doctoral student in geology at the University of the Basque Country, recently analyzed how much effort the Atxurra artists expended just to access spots where they left their mark—the ancient art is found only in the cave’s deeper passages, 600 feet or more from the entrance. The most elaborate scenes were also along ledges up to 16 feet above the cave floor. To reach them, “you need to climb,” says Intxaurbe, who has a special interest in Atxurra: He and University of Cantabria archaeologist Diego Garate were the duo who discovered the Ledge of Horses there in 2015.

For his recent paper, published in January in the Journal of Archaeological Science, Intxaurbe tracked the pace of more than 20 cavers and scientists as they moved through a cave similar to Atxurra but without archaeological remains. Based on that data, he was able to estimate how long it would have taken to reach the Ledge of Horses and other Atxurra artwork. His results confirmed that the artists chose areas that were particularly difficult to access. The art was meant to be hidden.

Artists and any audience for their work would have needed light to reach the sites, and to view the art. As part of her doctoral research at the University of the Basque Country, archaeologist M. Ángeles Medina-Alcaide and colleagues built torches, stone lamps, and a bonfire, modeled after artifacts recovered from rock art sites. They tested the replicas in another art-free cave near Atxurra, measuring light properties and monitoring air quality.

Researchers built torches and other light sources similar to what the Paleolithic artists would have used. The scientists then recorded their brightness, temperature, burn time, and other aspects. BEFORE ART PROJECT/COURTESY IÑAKI INTXAURBE

The experiments, published last month in PLOS ONE, revealed that torches worked best for traveling through the cave, but lasted an hour, tops. The grease lamps, which burned longer with less smoke, were ideal for extended stays in small corridors. A bonfire built on the cave floor cast the most light, but filled the chamber with smoke (and ended the experiment) within half an hour.

“This is fabulous data,” says Moyes, who was not involved in the research. “They’ve done such a good job of quantifying the different types of light and the different light sources, and no one else has really done that.”

Medina-Alcaide’s team then applied the findings to Atxurra. For the 40-minute trek to the Ledge of Horses, and the return trip to daylight, the Paleolithic people would have needed at least two torches. While engraving and painting, they probably used lamps. Using a virtual model of Atxurra, the researchers found that the Ledge of Horses art would have been barely visible to people standing on the cave floor. However, fires built directly on the ledge, eight feet above the cave floor, would have illuminated the entire scene, with smoke collecting above, rather than around, people standing below.

The paper’s conclusions fit with archaeological evidence at Atxurra. Ashes, charcoal, and other signs of a hearth were found on the ledge, indicating multiple fires had been built there. More charcoal fragments and smudges suggested torch use in the passages leading to the decorated chambers.

Azéma welcomes the research and considers it to be a step that’s “essential to understand this art... the placement, the composition, the movement.”

During the experiments with flames, Intxaurbe says he and colleagues also experienced the movement of images that Azéma wrote about in French caves. Perhaps that was the artists’ intent, to transform the cave into a cinema where the bison wink and the horses trot.

“We don’t know why [Paleolithic people] put these paintings in the backs of caves,” says Moyes. “We may never know.” But, she adds, these kinds of experiments provide critical

insights, as do archaeological remains, including pigments, fire traces, and the art itself. While the reason Stone Age artists rendered exquisite figures in these dark spaces continues to elude us, we can at least experience this art as our ancestors did—in warm light and dancing shadows.

Please visit the site: <https://www.atlasobscura.com/articles/atxurra-cave-art-experimental-archaeology> [Go there for pix]

IRAQ RECLAIMS 17,000 LOOTED ARTIFACTS, ITS BIGGEST-EVER REPATRIATION, BY JANE ARRAF

The cuneiform tablets and other objects had been held by the Museum of the Bible, founded by the family that owns the Hobby Lobby craft store chain, and by Cornell University.

When the Iraqi prime minister's plane touched down in Baghdad last week after an official visit to the United States, its cargo included 17,000 archaeological artifacts returned by a prominent museum and an Ivy League university in the largest-ever repatriation of looted Iraqi antiquities.

On Tuesday, plywood crates holding the thousands of clay tablets and seals — pieces from Mesopotamia, site of the world's earliest civilizations — were stacked next to a table displaying a few of the artifacts as the Iraqi Culture Ministry took custody of the cultural treasures.

The repatriation of so many objects rounds out a remarkable chapter in the story of a country so ravaged by decades of conflict and war that its very history was pulled out of the ground by antiquities thieves and sold abroad, ending up on display in other countries' museums. And it is a victory in a global effort by countries to press Western institutions to return culturally vital artifacts, like the push to repatriate the famed Benin Bronzes to Nigeria.

“This is not just about thousands of tablets coming back to Iraq again — it is about the Iraqi people,” Hassan Nadhem, the Iraqi minister of culture, tourism and antiquities, said in a telephone interview. “It restores not just the tablets, but the confidence of the Iraqi people by enhancing and supporting the Iraqi identity in these difficult times.”

The institution that held about 12,000 of the items was the Museum of the Bible, a four-year-old Washington museum founded and funded by the Christian evangelical family that owns the Hobby Lobby craft store chain. The addition of artifacts from ancient Mesopotamia was intended to provide context for Old Testament events.

Four years ago, the U.S. Department of Justice fined Hobby Lobby \$3 million for failing to exercise due diligence in its acquisitions of more than 5,000 artifacts; some of those artifacts were among those returned last week to Iraq. Hobby Lobby agreed as part of the government lawsuit to tighten its acquisition procedures, and the museum found thousands more suspect artifacts after it later initiated a voluntary review of its collection.

More than 5,000 of the other pieces returned last week had been held by Cornell University. That collection from a previously unknown Sumerian city of Garsana was donated to the university in 2000 by an American collector. Partly because the city was unknown, it was widely suspected by archaeologists to have come from a looted archaeological site in the south of Iraq.

The holdings underline a thriving market in stolen antiquities and highlight the plight of countries like Iraq, which has been subjected to three decades of antiquities looting. When government forces lost control of parts of southern Iraq in 1991, in the aftermath of the first Gulf War, widespread looting occurred at unexcavated sites. And the industrial-scale thefts continued amid a security vacuum after the 2003 U.S.-led invasion.

Many of the returned clay tablets and seals are from Irisagrig, a lost ancient city. The city's existence became known only when tablets mentioning it were seized at the Jordanian border in 2003, while thousands more surfaced in international antiquities markets.

Southern Iraq, part of ancient Mesopotamia, contains thousands of unexcavated archaeological sites between the Tigris and Euphrates Rivers where the world's first known civilizations began. Babylon and Ur, the reputed birthplace of the Prophet Abraham, flourished there, and it is where writing, astronomy and the first known code of law originated.

Hobby Lobby's batch of repatriated objects does not include what had been the best-known of its holdings from Mesopotamia: a clay tablet fragment roughly 3,500 years old inscribed with a fragment of the Gilgamesh epic, an ancient saga mentioning the Great Flood and the Garden of Eden that predates the Old Testament by many centuries.

The Justice Department, which describes it as "stolen Iraqi property," seized the tablet in 2019. It is the only Hobby Lobby artifact among those being returned to Iraq to have been exhibited in the Museum of the Bible.

The Museum of the Bible in Washington was founded by the family that owns the Hobby Lobby craft store chain. Credit...Saul Loeb/Agence France-Presse — Getty Images

Hobby Lobby, which is suing Christie's auction house to recover the \$1.6 million that it paid for the fragment in a private sale in London, withdrew its objections to returning it in July. Now in a federal warehouse in Brooklyn, the piece is expected to be handed back to Iraq in a few weeks.

The tablet, about 6 inches by 5 inches, was first offered for sale by a Jordanian antiquities dealer in London in 2001. It then changed hands several times, and in 2014 Christie's brokered a private sale of it to Hobby Lobby with documents later found to be false. The Justice Department said that a dealer had warned that the provenance would not withstand the scrutiny of a public auction. Christie's has said it did not know the documents were fake.

Hobby Lobby's president, Steve Green, has said that he knew nothing about collecting when he started the museum and that he had been misled by unscrupulous dealers.

Some of the artifacts were bought in lots of up to 2,000 pieces with what the museum's current director has described as paperwork so vague that the museum did not know what it was getting.

Because most of the objects bought for the museum were not studied, they remain a mystery. The sole artifact that it has kept from the collection, a cuneiform-inscribed brick from a temple in Nebuchadnezzar's period, has a clear provenance. The museum says that export papers from the family that donated it show that it was legally taken from Iraq to the United States in the 1920s.

But the artifacts returned by Cornell have been widely studied by scholars who published their findings. Many archaeologists criticize any research into potentially looted items, saying it not only deprives the countries of origin of the opportunity to study the objects themselves, but also helps fuel the trade in looted antiquities by raising black-market prices for similar items.

"We missed this great opportunity to study our tablets, our heritage," said Mr. Nadhem, the culture minister, who said that Cornell had not consulted Iraq on its research of the tablets. "This is a kind of bitterness in our mouth."

Cornell, which has revealed little about the return of its collection, said that it had repatriated 5,381 clay tablets to Iraq. In 2013, the U.S. Justice Department urged the university to give back thousands of ancient tablets believed to have been looted from the country in the 1990s, according to the Los Angeles Times.

Asked about the returned artifacts, Cornell provided a statement thanking the Iraqi government "for their partnership as we continued the crucial work of preserving these important artifacts for future generations to study." It also said it had published studies about the tablets for "the cultural benefits of the Republic of Iraq."

The returned Hobby Lobby artifacts include thousands of pieces seized by the U.S. government in 2011, which became the basis of the Justice Department fine against the company. They included cuneiform tablets, ancient cylinder seals and clay seal impressions known as bullae.

Most of the shipments, according to the Justice Department, had been marked Turkish "ceramic tiles" and shipped to Hobby Lobby and two corporate affiliates from dealers in the United Arab Emirates. Others from Israel falsely declared Israel as their country of origin.

The Museum of the Bible counted more than 8,000 others when it began reviewing the provenance of every item in its collection in an effort to emerge from scandals resulting from the Hobby Lobby acquisitions.

The museum's highest-profile acquisitions, purported fragments of the Dead Sea Scrolls, turned out to be forgeries.

When it became clear shortly after the museum opened that it could not verify the provenance of the Mesopotamia artifacts, it packed them up to be returned.

"In a large measure, the contents are pretty much unknown," said Jeffrey Kloha, the museum's director of collections, who joined after the pieces were acquired. He has previously said that more than 5 percent of the artifacts bought by Hobby Lobby that were said to be from ancient Mesopotamia are fake.

Now, with the return of the Iraqi and, previously, of other suspect holdings, the museum has turned its focus to domestic acquisitions with much clearer provenance, including early Bibles, Mr. Kloha said.

Patty Gerstenblith, director of the Center for Art, Museum and Cultural Heritage Law at DePaul University in Chicago, said that because the importance of the returned Iraqi artifacts was unknown, it was difficult to assess the repatriation in archaeological terms.

But she said the move had symbolic value.

“I think the fact that the museum proactively went through and said, ‘OK, we really can’t establish where this stuff came from,’ that was also an important step,” she said. “Other museums should do the same thing.”

Please visit the site: <https://www.nytimes.com/2021/08/03/world/middleeast/iraq-looted-artifacts-return.htm> [Go there or pix]

EVIDENCE OF 2,800-YEAR-OLD BIBLICAL EARTHQUAKE FOUND IN JERUSALEM, BY ROSSELLA TERCATIN

Evidence of an earthquake that took place 2,800 years ago had been found in the past at other sites, but Israeli archaeologists had never uncovered any indication of it in Jerusalem.

Some 2,800 years ago, a powerful earthquake hit the land of Israel. Now for the first time, archaeologists found evidence of the event in Jerusalem, in the City of David National Park, the Israel Antiquities Authority announced Wednesday.

“The words of Amos, a sheep breeder from Tekoa, who prophesied concerning Israel in the reigns of Kings Uzziah of Judah and Jeroboam son of Joash of Israel, two years before the earthquake,” reads the first verse of the book of Amos.

“And the Valley in the Hills shall be stopped up, for the Valley of the Hills shall reach only to Azal; it shall be stopped up as it was stopped up as a result of the earthquake in the days of King Uzziah of Judah.—And the LORD my God, with all the holy beings, will come to you,” reads another passage in Zechariah, recalling the event some 200 years later, to suggest how strong of a collective memory it left.

While evidence of the earthquake had been found in the past at other sites in Israel, such as Hazor and Tell es-Safi/Gath, archaeologists had never uncovered any indication of it in Jerusalem, until they were surprised to find broken vessels and other signs of destruction dating back to a period when Jerusalem was not subjected to any conquest or other violent event in some buildings in the city of David.

“When we excavated the structure and uncovered an 8th century BCE layer of destruction, we were very surprised, because we know that Jerusalem continued to exist in succession until the Babylonian destruction, which occurred about 200 years later,” IAA excavation directors Dr. Joe Uziel and Ortal Chalaf said.

“We asked ourselves what could have caused that dramatic layer of destruction we uncovered. Examining the excavation findings, we tried to check if there is a reference to it in the biblical text. Interestingly, the earthquake that appears in the Bible in the books of Amos and Zechariah, occurred at the time when the building we excavated in the City of David collapsed.”

Among the artifacts, the archeologists found fragments of beautiful vessels and small tables. It appears that residents of the area – which is located on the steep eastern slope, just a few dozen meters from the Temple Mount – built again on top of the ruins left by the earthquake, preserving its traces.

The buildings are located adjacent to the Jerusalem city wall dating back to the First Temple period (1200-586 BCE).

The wall, as well as the nearby houses, were destroyed by the Babylonians when they conquered Jerusalem in 586 BCE.

Centuries later, they would be used once again, as the foundation of new buildings.

The findings will be presented to the public at the "City of David Research" conference of the Megalim Institute which will take place next month.

Please visit the site: <https://www.jpost.com/archaeology/evidence-of-2800-year-old-biblical-earthquake-found-in-jerusalem-675809> [Go there for pix]

RAT BONES SHOW CLIMATE HELPED EARLY HUMANS OUT OF AFRICA THROUGH ISRAEL, BY ROSSELLA TERCATIN

Researchers explained that the rodents, in order to survive at the time, would have needed more humid conditions, suggesting that the Judean Desert was greener and wetter.

Climate change creating favorable conditions for life, more than a specific ability to adapt to harsh conditions, supported early humans' migration from Africa to Europe and Asia through the Levant, new research based on remains of an extinct poisonous rat found in Israel has suggested.

During excavations conducted in the Judean Desert in search of new Dead Sea Scrolls led by the Antiquities Authority (IAA), the archaeologists ran into a cave with a high number of bones belonging to an ancient rodent related to the eastern African crested rat, a long haired animal somewhat similar to a porcupine and equipped with a poisonous mane to fend off predators.

A team of Israeli and international researchers – led by Dr. Ignacio A. Lazagabaster of the University of Haifa and the Museum of Nature in Berlin with colleagues from Tel Aviv University, the Hebrew University of Jerusalem, Montpellier University, the Geological Survey of Israel and the IAA – analyzed the fossils, including some DNA that they were able to extract. The findings were published in the academic journal PNAS (Proceedings of the National Academy of Sciences of the United States of America).

“We were able to extract DNA from the ancient bones in the Paleogenetic Laboratory at the Steinhardt Museum of Natural History – the earliest DNA extracted from bones in our region to date,” the authors explained. “Genetic and morphological analysis reveals that it is a subspecies of the crested rat that currently lives in East Africa.”

“These are very, very close animals, so if today this species lives in humid areas, chances are that even about 100,000 years ago the subspecies we found would have needed the same conditions,” they added, suggesting that at the time the Judean Desert was greener and wetter.

According to the dating conducted by the researchers using radio-carbon and other methods, the bones found date back to a period between 120,000 and 42,000 years. While the first human migration from Africa began as early as 1.8 million years ago, modern humans are thought to have left Africa and spread out to other areas of the world, passing through the territory of modern Israel starting around 100,000 years ago. Scholars have been debating whether their ability to travel and cross deserts is to be attributed to more favorable climatic conditions compared to those presented by the same areas in modern times, or to specific skills developed by humans that allowed them to survive in harsher conditions.

“Since there cannot be any doubt that this species presented special technological capabilities and its modality of spreading happened through slow movements over similar climatic areas, we assume that the same African species reached the Judean Desert through an ancient climatic corridor,” the researchers noted. “It is likely that also humans, who migrated from Africa to the Levant at that time, were aided by the same ecological corridor.”

Please visit the site: <https://www.ipost.com/archaeology/rat-bones-show-climate-helped-early-humans-out-of-africa-through-israel-675062> [Go there for pix]

FRUIT BASKETS FROM FOURTH CENTURY BC FOUND IN RUINS OF THONIS- HERACLEION ‘INCREDIBLE’ DISCOVERIES AT SUBMERGED ANCIENT CITY OFF COAST OF EGYPT HAVE LAIN UNTOUCHED, BY DALYA ALBERGE

Wicker baskets filled with fruit that have survived from the 4th century BC and hundreds of ancient ceramic artefacts and bronze treasures have been discovered in the submerged ruins of the near-legendary city of Thonis-Heracleion off the coast of Egypt.

They have lain untouched since the city disappeared beneath the waves in the second century BC, then sank further in the eighth century AD, following cataclysmic natural disasters, including an earthquake and tidal waves.

Thonis-Heracleion – the city’s Egyptian and Greek names – was for centuries Egypt’s largest port on the Mediterranean before Alexander the Great founded Alexandria in 331BC.

But the vast site in Aboukir Bay near Alexandria was forgotten until its re-discovery by the French marine archaeologist Franck Goddio two decades ago, in one of the greatest archaeological finds of recent times.

Colossal statues were among treasures from an opulent civilisation frozen in time. Some of the discoveries were shown in a major exhibition at the British Museum in 2016.

Goddio has been taken aback by the latest discoveries. He told the Guardian that the fruit baskets were “incredible”, having been untouched for more than 2,000 years.

They were still filled with doum, the fruit of an African palm tree that was sacred for the ancient Egyptians, as well as grape-seeds.

“Nothing was disturbed,” he said. “It was very striking to see baskets of fruits.”

One explanation for their survival may be that they were placed within an underground room, Goddio said, noting a possible funerary connotation.

It is within an area where Goddio and his team of archaeologists have discovered a sizeable tumulus (a mound raised over graves) – about 60 metres long by 8 metres wide – and sumptuous Greek funerary offerings

They date from the early fourth century BC when Greek merchants and mercenaries lived in Thonis-Heracleion. The city controlled the entrance to Egypt at the mouth of the Canopic branch of the Nile. The Greeks were allowed to settle there during the late Pharaonic period, constructing their own sanctuaries.

Goddio said of the tumulus: “It is a kind of island surrounded by channels. In those channels, we found an unbelievable amount of deposits made of bronze, including a lot of statuettes of Osiris [the ancient Egyptian fertility god].

“On that island, something totally different. We found hundreds of deposits made of ceramic. One above the other. These are imported ceramic, red on black figures from Attic.”

The finds are all the more intriguing because there were vast quantities of miniature ceramics – high-quality Ancient Greek examples, including amphorae– under the tumulus. Bronze artefacts were around the tumulus, including mirrors and statuettes.

Goddio also found extensive evidence of burning, suggesting a “spectacular” ceremony that led to people being barred from entering this site again. It appears to have been sealed for hundreds of years as none of the artefacts found were from later than the early fourth century, even though the city lived on for several hundred years.

“There’s something very strange here,” he said. “That site has been used maybe one time, never touched before, never touched after, for a reason that we cannot understand for the time being. It’s a big mystery.”

He hopes to find answers within some of the treasures, which include the well-preserved remains of a wooden sofa for banquets, a large Attic vase and a gold amulet of “exquisite quality”.

About 350 metres away, the archaeologists also found a unique Ptolemaic galley, 25 metres in length. While built in the classical tradition, with mortise-and-tenon joints, it also contains features of ancient Egyptian construction, with a flat-bottomed design that would have been perfect for navigation on the Nile and in the delta.

The European Institute for Underwater Archaeology, led by Goddio, works in close cooperation with Egypt’s ministry of tourism and antiquities and with the support of the Hilti Foundation. The finds will be studied and preserved before being put on display in museums.

The potential for further discoveries is tantalising. Even after conducting repeated excavations over the past two decades, Goddio estimates that only about 3% of the area has been explored so far.

Please visit the site: <https://www.theguardian.com/science/2021/aug/02/fruit-baskets-from-fourth-century-bc-found-in-ruins-of-thonis-heracleion>

HOW ANCIENT PEOPLE FELL IN LOVE WITH BREAD, BEER AND OTHER CARBS, BY ANDREW CURRY

Well before people domesticated crops, they were grinding grains for hearty stews and other starchy dishes.

On a clear day, the view from the ruins of Göbekli Tepe stretches across southern Turkey all the way to the Syrian border some 50 kilometres away. At 11,600 years old, this mountaintop archaeological site has been described as the world's oldest temple — so ancient, in fact, that its T-shaped pillars and circular enclosures pre-date pottery in the Middle East.

The people who built these monumental structures were living just before a major transition in human history: the Neolithic revolution, when humans began farming and domesticating crops and animals. But there are no signs of domesticated grain at Göbekli Tepe, suggesting that its residents hadn't yet made the leap to farming. The ample animal bones found in the ruins prove that the people living there were accomplished hunters, and there are signs of massive feasts.

Archaeologists have suggested that mobile bands of hunter-gatherers from all across the region came together at times for huge barbecues, and that these meaty feasts led them to build the impressive stone structures.

Now that view is changing, thanks to researchers such as Laura Dietrich at the German Archaeological Institute in Berlin. Over the past four years, Dietrich has discovered that the people who built these ancient structures were fuelled by vat-fulls of porridge and stew, made from grain that the ancient residents had ground and processed on an almost industrial scale¹. The clues from Göbekli Tepe reveal that ancient humans relied on grains much earlier than was previously thought — even before there is evidence that these plants were domesticated. And Dietrich's work is part of a growing movement to take a closer look at the role that grains and other starches had in the diet of people in the past.

The researchers are using a wide range of techniques — from examining microscopic marks on ancient tools to analysing DNA residues inside pots. Some investigators are even experimentally recreating 12,000-year-old meals using methods from that time. Looking even further back, evidence suggests that some people ate starchy plants more than 100,000 years ago. Taken together, these discoveries shred the long-standing idea that early people subsisted mainly on meat — a view that has fuelled support for the palaeo diet, popular in the United States and elsewhere, which recommends avoiding grains and other starches.

The new work fills a big hole in the understanding of the types of food that made up ancient diets. "We're reaching a critical mass of material to realize there's a new category we've been missing," says Dorian Fuller, an archaeobotanist at University College London.

A garden of grinding stones

Dietrich's discoveries about the feasts at Göbekli Tepe started in the site's 'rock garden'. That's the name archaeologists dismissively gave a nearby field where they dumped basalt grinding stones, limestone troughs and other large pieces of worked stone found amid the rubble.

As excavations continued over the past two decades, the collection of grinding stones quietly grew, says Dietrich. "Nobody thought about them." When she started cataloguing them in 2016, she was stunned at the sheer numbers. The 'garden' covered an area the size of a football field, and contained more than 10,000 grinding stones and nearly 650 carved stone platters and vessels, some big enough to hold up to 200 litres of liquid.

"No other settlement in the Near East has so many grinding stones, even in the late Neolithic, when agriculture was already well-established," Dietrich says. "And they have a whole spectrum of stone pots, in every thinkable size. Why so many stone vessels?" She suspected that they were for grinding grain to produce porridge and beer. Archaeologists had long argued that stone vats at the site were evidence of occasional ceremonial beer consumption at Göbekli Tepe, but thought of it as a rare treat.

Teasing answers from the stones there and at other sites is not a simple process. In archaeology, it is much easier to spot evidence of meat meals than ones based on grains or other plants. That's because the bones of butchered animals fossilize much more readily than do the remains of a vegetarian feast. The fragile nature of ancient plant remains makes archaeobotany — the study of how ancient people used plants — tricky, time-consuming work. Researchers use sieves, fine mesh and buckets to wash and separate debris from archaeological sites. Tiny bits of organic material such as seeds, charred wood and burnt food float to the top, while heavier dirt and rocks sink.

The vast majority of what emerges amounts to the raw ingredients, the bits that never made it into a pot. By identifying and counting grass seeds, grain kernels and grape pips mixed into the soil, archaeobotanists can tell what was growing in the area around the settlement. Unusual amounts of any given species offer circumstantial evidence that those plants might have been used, and perhaps cultivated, by people in the past.

Move over, DNA: ancient proteins are starting to reveal humanity's history

Some of the earliest evidence for plant domestication, for example, comes from einkorn wheat grains recovered from a site near Göbekli Tepe that are subtly different in shape and genetics from wild varieties². At Göbekli Tepe itself, the grains look wild, suggesting that domestication hadn't taken place or was in its earliest stages.

(Archaeologists suspect that it might have taken centuries for domestication to alter the shape of grains.)

Direct proof that plants landed in cooking pots is harder to come by.

To work out what people were eating, archaeologists are turning to previously ignored sources of evidence, such as charred bits of food.

They're the mistakes of the past: stews and porridge left on the fire for too long, or bits of bread dropped in the hearth or burnt in the oven. "Anyone who's cooked a meal knows sometimes it burns," says Lucy Kubiak-Martens, an archaeobotanist working for BIAx Consult Biological Archaeology & Environmental Reconstruction in Zaandam, the Netherlands.

Until the past few years, these hard-to-analyse remnants of ruined meals were rarely given a second look. "It's just a difficult material. It's fragile, ugly stuff," says Andreas Heiss, an archaeobotanist at the Austrian Academy of Sciences in Vienna. "Most researchers just shied away." Pottery sherds encrusted with food remains were cleaned off or discarded as 'crud ware', and charred bits of food were dismissed as unanalysable 'probable food' and shelved or thrown out.

The first step towards changing that perception was to go back to the kitchen. That was the inspiration of Soultana Valamoti, an archaeobotanist at the Aristotle University of Thessaloniki in Greece who, not coincidentally, is also a passionate home cook. Valamoti spent the early years of her career toting buckets and sieves from one excavation site to another across Greece, all while combing museum storerooms for ancient plant remains to analyse. The work convinced her there was an untapped wealth of evidence in burnt food remains — if she could find a way to identify what she was looking at.

More than 20 years ago, Valamoti decided to turn her lab into an experimental kitchen. She ground and boiled wheat to make bulgur, and then charred it in an oven to simulate a long-ago cooking accident (see 'Fast food of the Bronze Age'). By comparing the burnt remains to 4,000-year-old samples from a site in northern Greece, she was able to show that the ancient and modern versions matched, and that this way of preparing grain had its roots in the Bronze Age³.

Over the decade that followed, she continued experimenting. Beginning in 2016, a European Research Council grant allowed her to create a crusty, charred reference collection of more than 300 types of ancient and experimental samples. After making bread dough, baked bread, porridge, bulgur and a traditional food called trachana from heirloom wheat and barley, Valamoti chars each sample in an oven under controlled conditions.

She then magnifies the crispy results by 750 to 1,000 times to identify the tell-tale changes in cell structure caused by different cooking processes. Whether boiled or fresh, ground or whole, dried or soaked, the grains all look different at high magnification. Baking bread leaves tell-tale bubbles behind, for example, whereas boiling grain before charring it gelatinizes the starch, Valamoti says. "And we can see all that under the scanning electron microscope."

How did Neanderthals and other ancient humans learn to count?

Comparing the ancient samples with her modern experiments, Valamoti has been able to go beyond identifying plant species to reconstruct the cooking methods and dishes of ancient Greece. There is evidence that people in the region have been eating bulgur for at least 4,000 years⁴. By boiling barley or wheat and then drying it for storage and quick rehydration later, "you could process the harvest in bulk and take advantage of the hot

sun”, Valamoti says. “Then you can use it throughout the year. It was the fast food of the past.”

Other researchers are also pursuing ancient cooking mistakes. Charred food remains “are providing us with direct evidence of food”, says Amaia Arranz-Otaegui, an archaeobotanist at the Paris Museum of Natural History. “That’s revolutionary. It’s an unprecedented source of information.”

In the past, it has been difficult for researchers to find hard evidence that our distant ancestors ate plants. “We’ve always suspected starch was in the diet of early hominins and early Homo sapiens, but we didn’t have the evidence,” says Kubiak-Martens.

Genetic data support the idea that people were eating starch. In 2016, for example, geneticists reported⁵ that humans have more copies of the gene that produces enzymes to digest starch than do any of our primate relatives. “Humans have up to 20 copies, and chimpanzees have 2,” says Cynthia Larbey, an archaeobotanist at the University of Cambridge, UK.

That genetic change in the human lineage helped to shape the diet of our ancestors, and now us. “That suggests there’s a selective advantage to higher-starch diets for Homo sapiens.”

To find supporting evidence in the archaeological record, Larbey turned to cooking hearths at sites in South Africa dating back 120,000 years, picking out chunks of charred plant material — some the size of a peanut. Under the scanning electron microscope, she identified cellular tissue from starchy plants⁶ — the earliest evidence of ancient people cooking starch. “Right through from 120,000 to 65,000 years ago, they’re cooking roots and tubers,” Larbey says. The evidence is remarkably consistent, she adds, particularly compared with animal remains from the same site. “Over time they change hunting techniques and strategies, but still continue to cook and eat plants.”

Early humans probably ate a balanced diet, leaning on starchy plants for calories when game was scarce or hard to hunt. “And being able to find carbohydrates as they moved into new ecologies would have provided important staple foods,” Larbey adds.

Evidence suggests that plants were popular among Neanderthals, too. In 2011, Amanda Henry, a palaeoanthropologist now at Leiden University in the Netherlands, published her findings from dental plaque picked from the teeth of Neanderthals who were buried in Iran and Belgium between 46,000 and 40,000 years ago. Plant microfossils trapped and preserved in the hardened plaque showed that they were cooking and eating starchy foods including tubers, grains and dates⁷. “Plants are ubiquitous in our environment,” Henry says, “and it’s no surprise we put them to use.”

Indigenous groups look to ancient DNA to bring their ancestors home

In May, Christina Warinner, a palaeogeneticist at Harvard University in Cambridge, Massachusetts, and her colleagues reported the extraction of bacterial DNA from the dental plaque of Neanderthals, including a 100,000-year-old individual from what is now Serbia. The species they found included some that specialized in breaking down starch into sugars, supporting the idea that Neanderthals had already adapted to a plant-rich

diet⁸. Plaque on the teeth of early modern humans shared a similar bacterial profile, providing more evidence to suggest that they were eating starchy plants.

The finds push back against the idea that our ancestors spent their time sitting around campfires mostly chewing on mammoth steaks. It's an idea that has penetrated popular culture, with proponents of the palaeo diet arguing that grains, potatoes and other starchy foods have no place on our plates because our hunter-gatherer ancestors didn't evolve to eat them.

But it has become clear that early humans were cooking and eating carbs almost as soon as they could light fires. "The old-fashioned idea that hunter-gatherers didn't eat starch is nonsense," says Fuller.

Invisible cooks

The push to better understand how people were cooking in the past also means paying more attention to the cooks themselves. It's part of a larger trend in archaeology to look at household activities and daily lives. "Essentially, we're trying to figure out what kind of information you can find out about people who have never had histories written about them," says Sarah Graff, an archaeologist at Arizona State University in Tempe.

In the past, when researchers found plant remains at archaeological sites, they often considered them as accidental 'ecofacts' — natural objects, such as seeds, pollen and burnt wood, that offer evidence for what kind of plants grew in a region. But there has been a shift towards treating food remains as evidence of an activity that required craft, intent and skill. "Prepared food needs to be looked at as an artefact first and a species second," Fuller says. "Heated, fermented, soaked — making food is akin to making a ceramic vessel."

And, as researchers increasingly collaborate to compare ancient remains, they're finding remarkable similarities across time and cultures. At Neolithic sites in Austria dating back more than 5,000 years, for example, archaeologists found unusually shaped charred crusts. It was as though the contents of a large jar or pot had been heated until the liquid burned off, and the dried crust inside began to burn. The team's first guess was that the crusts were from grain storage jars destroyed in a fire. But under the scanning electron microscope, the cell walls of individual grains looked unusually thin — a sign, Heiss says, that something else was going on.

After comparing the Austrian finds to similar crusts found in Egyptian breweries from around the same time, Heiss and Valamoti concluded that the thin cell walls were the result of germination, or malting, a crucial step in the brewing process. These early Austrian farmers were brewing beer⁹. "We ended up with something completely different" from the earlier hypotheses, Heiss says. "Several lines of evidence really interlocked and fell into place."

Bread, it seems, goes even further back. Arranz-Otaegui was working at a 14,500-year-old site in Jordan when she found charred bits of 'probable food' in the hearths of long-ago hunter-gatherers. When she showed scanning electron microscope images of the stuff to Lara González Carretero, an archaeobotanist at the Museum of London Archaeology who works on evidence of bread baking at a Neolithic site in Turkey called Çatalhöyük,

both researchers were shocked. The charred crusts from Jordan had tell-tale bubbles, showing they were burnt pieces of bread¹⁰.

Hundreds of Israel's archaeological sites are vanishing under concrete

Most archaeologists have assumed that bread didn't appear on the menu until after grain had been domesticated — 5,000 years after the cooking accident in question. So it seems that the early bakers in Jordan used wild wheat.

The evidence provides crucial clues to the origins of the Neolithic revolution, when people began to settle down and domesticate grain and animals, which happened at different times in various parts of the world. Before farming began, a loaf of bread would have been a luxury product that required time-consuming and tedious work gathering the wild grain needed for baking. That hurdle could have helped to spur crucial changes.

Arranz-Otaegui's research suggests that — at least in the Near East — demand for bread might have been a factor in driving people to attempt to domesticate wheat, as they looked for ways to ensure a steady supply of baked goods. "What we are seeing in Jordan has implications for bigger processes. What drove the transition to agriculture is one of the fundamental questions in archaeology," Arranz-Otaegui says. "This shows hunter-gatherers were using cereals."

The next frontier for archaeobotanists is prehistoric salad bars. Researchers are working on ways to look for the remains of food that wasn't cooked, such as leafy greens, another overlooked part of the ancient diet. Because raw greens and vegetables are even harder to find in the archaeological record than cooked seeds and grains, Kubiak-Martens calls them the "missing link" in knowledge about ancient diets. "There's no way to prove green leaves were eaten from charred remains," Kubiak-Martens says. "But you would be surprised at how much green vegetables are in human coprolites", or preserved faeces. Kubiak-Martens got a grant in 2019 to look at 6,300-year-old palaeofaeces preserved at wetland sites in the Netherlands, which she hopes will reveal everything prehistoric farmers there had on their dinner tables.

Recreating ancient meals

The quest to understand ancient diets has led some researchers to take extreme measures. That's the case with Göbekli Tepe, which has yielded very few organic remains that could provide clues to the prehistoric plant-based meals there. So Dietrich has tried innovative thinking — and a lot of elbow grease. Her approach has been to recreate the tools people used to make food, not the dishes themselves.

In her airy lab on a tree-lined street in Berlin, Dietrich explains her time-consuming and physically demanding process. Starting with a replica grindstone — a block of black basalt the size of a bread roll that fits neatly in the palm of her hand — she photographs it from 144 different angles.

After spending eight hours grinding four kilograms of heirloom einkorn wheat kernels, Dietrich photographs the stone again. A software program then produces 3D models from the two sets of pictures. Her experiments have shown that grinding fine flour for baking

bread leaves a different finish on the stones from producing coarsely ground grain that is ideal for boiling as porridge or brewing beer.

And after handling thousands of grindstones, she is often able to identify what they were used for by touch. “I touch the stones to feel for flattening,” she says. “Fingers can feel changes at the nano level.” By comparing the wear patterns on her modern replicas to the stones piled in Göbekli Tepe’s rock garden, Dietrich could show that fine-ground bread flour was the exception. In a 2020 study¹¹, she argues people there were mostly grinding grain coarsely, just enough to break up its tough outer layer of bran and make it easy to boil and eat as porridge or ferment into beer.

To test the theory, Dietrich commissioned a stonemason to carve a replica of a 30-litre stone vat from Göbekli Tepe. In 2019, she and her team successfully cooked porridge using heated stones, carefully recording and timing each step of the process. They also brewed a Neolithic beer from hand-ground germinated grain, or malt, in the open vessel. The results were “a bit bitter, but drinkable”, Dietrich says. “If you’re thirsty in the Neolithic.”

From the grind stones and other plant-processing tools at Göbekli Tepe, a picture is now emerging for what was going on there 12,000 years ago. Rather than just starting to experiment with wild grains, the monument builders were apparently proto-farmers, already familiar with the cooking possibilities grain offered despite having no domesticated crops. “These are the best grinding tools ever, and I’ve seen a lot of grindstones,” Dietrich says. “People at Göbekli Tepe knew what they were doing, and what could be done with cereals. They’re beyond the experimentation phase.”

Her experiments are shifting the way archaeologists understand the site — and the period when it was built. Their initial interpretations made the site sound a bit like a US college fraternity house: lots of male hunters on a hilltop, washing down barbecued antelope with vats of lukewarm beer at occasional celebrations. “Nobody really thought of the possibility of plant consumption” on a large scale, Dietrich says.

In a study late last year¹², Dietrich argues the ‘barbecue and beer’ interpretation is way off. The sheer number of grain-processing tools at Göbekli Tepe suggest that even before farming took hold, cereals were a daily staple, not just part of an occasional fermented treat.

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Please visit the site: <https://www.nature.com/articles/d41586-021-01681-w> [Go there for notes. pix, and caps]

THE ANCIENT PERSIAN WAY TO KEEP COOL, BY KIMIYA SHOKOOHI

From ancient Egypt to the Persian Empire, an ingenious method of catching the breeze kept people cool for millennia. In the search for emissions-free cooling, the "wind catcher" could once again come to our aid.

The city of Yazd in the desert of central Iran has long been a focal point for creative ingenuity. Yazd is home to a system of ancient engineering marvels that include an underground refrigeration structure called yakhchāl, an underground irrigation system called qanats, and even a network of couriers called pirradaziš that predate postal services in the US by more than 2,000 years.

Among Yazd's ancient technologies is the wind catcher, or bādgir in Persian. These remarkable structures are a common sight soaring above the rooftops of Yazd. They are often rectangular towers, but they also appear in circular, square, octagonal and other ornate shapes.

Yazd is said to have the most wind catchers in the world, though they may have originated in ancient Egypt. In Yazd, the wind catcher soon proved indispensable, making this part of the hot and arid Iranian Plateau livable.

Though many of the city's wind catchers have fallen out of use, the structures are now drawing academics, architects and engineers back to the desert city to see what role they could play in keeping us cool in a rapidly heating world.

As a wind catcher requires no electricity to power it, it is both a cost-efficient and green form of cooling. With conventional mechanical air conditioning already accounting for a fifth of total electricity consumption globally, ancient alternatives like the wind catcher are becoming an increasingly appealing option.

There are two main forces that drive the air through and down into the structures: the incoming wind and the change in buoyancy of air depending on temperature – with warmer air tending to rise above cooler, denser air. First, as air is caught by the opening of a wind catcher, it is funneled down to the dwelling below, depositing any sand or debris at the foot of the tower. Then the air flows throughout the interior of the building, sometimes over subterranean pools of water for further cooling. Eventually, warmed air will rise and leave the building through another tower or opening, aided by the pressure within the building.

The shape of the tower, alongside factors like the layout of the house, the direction the tower is facing, how many openings it has, its configuration of fixed internal blades, canals and height are all finely tuned to improve the tower's ability to draw wind down into the dwellings below.

Some of the earliest wind-catching technology comes from Egypt 3,300 years ago

Using the wind to cool buildings has a history stretching back almost as long as people have lived in hot desert environments. Some of the earliest wind-catching technology comes from Egypt 3,300 years ago, according to researchers Chris Soelberg and Julie Rich of Weber State University in Utah. Here, buildings had thick walls, few windows facing the Sun, openings to take in air on the side of prevailing winds and an exit vent on the other side – known in Arabic as malqaf architecture. Though some argue that the birthplace of the wind catcher was Iran itself.

Wherever it was first invented, wind catchers have since become widespread across the Middle East and North Africa. Variations of Iran's wind catchers can be found in the barjeels of Qatar and Bahrain, the malqaf of Egypt, the mungh of Pakistan, and many other places, notes Fatemeh Jomehzadeh of the University of Technology Malaysia and colleagues.

Due to long disuse, many of Iran's windcatchers are not in a good state of repair. But some researchers would like to see them restored to working order (Credit: Alamy)

The Persian civilisation is widely considered to have added structural variations to allow for better cooling – such as combining it with its existing irrigation system to help to cool the air down before releasing it throughout the home. In Yazd's hot, dry climate, these structures proved remarkably popular, until the city became a hotspot of soaring ornate towers seeking the desert wind. The historical city of Yazd was recognised as a Unesco World Heritage site in 2017, in part for its proliferation of wind catchers.

As well as performing the functional purpose of cooling homes, the towers also had a strong cultural significance. In Yazd, the wind catchers are as much a part of the skyline as the Zoroastrian Fire Temple and Tower of Silence. Among them is the wind catcher at the Dowlatabad Abad Gardens, said to be the tallest in the world at 33m (108ft) and one of the few wind catchers still in operation. Housed in an octagonal building, it overlooks a fountain stretching past rows of pine trees.

Inconveniences like pests entering the chutes and the gathering of dust and desert debris have meant many have turned away from traditional wind catchers

The emissions-free cooling efficacy of such wind catchers make some researchers argue that they are due a revival.

Parham Kheirkhah Sangdeh has extensively studied the scientific application and surrounding culture of wind catchers in contemporary architecture at Ilam University in Iran. He says inconveniences like pests entering the chutes and the gathering of dust and desert debris have meant many have turned away from traditional wind catchers. In their place are mechanical cooling systems, such as conventional air-conditioning units. Often, those options are powered by fossil fuels and use refrigerants that act as powerful greenhouse gases if released into the atmosphere.

The advent of modern cooling technologies has long been blamed for the deterioration of traditional methods in Iran, the historian of Iranian architecture Elizabeth Beazley wrote in 1977. Without constant maintenance, the harsh climate of the Iranian Plateau has worn away many structures from wind catchers to ice houses. Kheirkhah Sangdeh also sees the

shift away from wind catchers as in part down to a tendency among the public to engage with technologies from the West.

"There needs to be some changes in cultural perspectives to use these technologies. People need to keep an eye on the past and understand why energy conservation is important," Kheirkhah Sangdeh says. "It starts with recognising cultural history and the importance of energy conservation."

Kheirkhah Sangdeh hopes to see Iran's wind catchers updated to add energy-efficient cooling to existing buildings. But he has met many barriers to his work in the form of ongoing international tensions, the coronavirus pandemic and ongoing water shortage. "Things are so bad in Iran that [people] take it day by day," says Kheirkhah Sangdeh.

Fossil-fuel-free methods of cooling like the wind catcher might well be due a revival, but to a surprising extent they are already present – albeit in a less magnificent form than those in Iran – in many Western countries.

In the UK, some 7,000 variations of wind catchers were installed in public buildings between 1979 and 1994. They can be seen from buildings such as the Royal Chelsea Hospital in London, to supermarkets in Manchester.

These modernised wind catchers bear little resemblance to Iran's towering structures. On one three-storey building on a busy road in north London, small hot pink ventilation towers allow passive ventilation. Atop a shopping centre in Dartford, conical ventilation towers rotate to catch the breeze with the help of a rear wing that keeps the tower facing the prevailing wind.

The US too has adopted wind-catcher-inspired designs with enthusiasm. One such example is the visitor center at Zion National Park in southern Utah. The park sits in a high desert plateau, comparable to Yazd in climate and topography, and the use of passive cooling technologies including the wind catcher nearly eliminated the need for mechanical air-conditioning. Scientists have recorded a temperature difference of 16C (29F) between the outside and inside of the visitor centre, despite the many bodies regularly passing through.

There is further scope for the spread of the wind catcher, as the search for sustainable solutions to overheating continues. In Palermo, Sicily, researchers have found that the climate and prevailing wind conditions make it a ripe location for a version of the Iranian wind catcher. This October, meanwhile, the wind catcher is set to have a high-profile position at the World Expo fair in Dubai, as part of a network of conical buildings in the Austrian pavilion, where the Austrian architecture firm Querkraft has taken inspiration from the Arabic barjeel version of the wind tower.

While researchers such as Kheirkhah Sangdeh argue that the wind catcher has much more to give in cooling homes without fossil fuels, this ingenious technology has already migrated further around the world than you might think. Next time you see a tall vented tower on top of a supermarket, high-rise or school, look carefully – you might just be looking at the legacy of the magnificent wind catchers of Iran.

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Please visit the site: <https://www.bbc.com/future/article/20210810-the-ancient-persian-way-to-keep-cool>

ARCHAEOLOGISTS CLAIM THEY’VE DISCOVERED THE TROJAN HORSE IN TURKEY, BY PHILIP CHRYSOPOULOS

Turkish archaeologists claim they have found what they believe are pieces of the Trojan Horse. According to a report by newsit.gr, Turkish archaeologists excavating the site of the historical city of Troy on the hills of Hisarlik have unearthed a large wooden structure. Historians and archaeologists think what they have discovered are remains of the legendary Trojan Horse.

The excavations brought to light dozens of fir planks and beams up to 15 meters (49 feet) long. The remnants were assembled in a strange form, that led the experts to suspect they belong to the Trojan Horse. The wooden structure was inside the walls of the ancient city of Troy.

The Trojan Horse is considered by most to have been a mythical structure. The horse is commonly associated with Homer’s epic poems the Iliad and the Odyssey.

The classic epic poems tell the story of the Trojan War and Odysseus’ long journey back to Ithaca, but curiously enough, they do not feature the iconic wooden horse. In fact, the Iliad closes out right before the war is over.

The story of the Trojan Horse comes in at the very end of the war, as it is used as a strategy to seize Troy and win the war completely. The story of the Trojan Horse is featured most prominently in the Aeneid by Virgil, a Latin text from the time of Augustus’ rule in Rome. Historians suggest that the ancient writer was using the image of the horse as an analogy for a war machine, or even perhaps a natural disaster.

The structure found fits the description by Virgil, Augustus and Quintus Smyrnaeus. So archaeologists have started to consider that the discovery is indeed the remains of the subterfuge Greeks used to conquer ancient Troy.

Another discovery that supports the archaeologists’ claims is a damaged bronze plate with the inscription “For their return home, the Greeks dedicate this offering to Athena.” Quintus Smyrnaeus refers to the particular plate in his epic poem “Posthomerica.” The plate was also found on the site.

Can the pieces of the Trojan Horse be scientifically verified?

The two archaeologists leading the excavation, Boston University professors Christine Morris and Chris Wilson, say that they have a “high level of confidence” that the structure is indeed linked to the legendary horse. They say that all the tests performed up to now have only confirmed their theory.

“The carbon dating tests and other analysis have all suggested that the wooden pieces and other artifacts date from the 12th or 11th centuries B.C.,” says Professor Morris. “This matches the dates cited for the Trojan War, by many ancient historians like

Eratosthenes or Proclus. The assembly of the work also matches the description made by many sources. I don't want to sound overconfident, but I'm pretty certain that we found the real thing!"

Please visit the site: <https://greekreporter.com/2021/08/10/archaeologists-discover-trojan-horse-in-turkey/>

POSSIBLE EVIDENCE FOR BIBLICAL EARTHQUAKE FOUND IN CITY OF DAVID, BY OWEN JARUS

The 2,800-year-old temblor is described in the Hebrew Bible.

Archaeologists have found evidence of an earthquake that hit the City of David in Jerusalem about 2,800 years ago and that could be a major event described in the Hebrew Bible.

During their excavations, the archaeological team, from the Israel Antiquities Authority, discovered a layer of destruction dating to that time in the City of David National Park. Inside the layer was "a row of shattered vessels, including bowls, lamps, cooking utensils, storage and storage jars, which were smashed as [a] building's walls collapsed," the archaeological team said in a statement from the IAA.

Archaeologists also found no signs of a fire, and they are doubtful that the city was attacked by an invading force.

Other sites in the region had similar destruction around 2,800 years ago, the researchers found, adding that the signs of destruction from several sites in the southern Levant could be evidence for a biblical earthquake. The books of Amos and Zechariah both mention an earthquake that happened around this time, when Jerusalem was the capital of the kingdom of Judah and was ruled by a king called Uzziah. "You will flee as you fled from the earthquake in the days of Uzziah king of Judah," Zechariah 14:5 reads.

"It seems likely that although Jerusalem was not the epicenter [of the earthquake], it was significantly affected," Joe Uziel, an archaeologist with the Israel Antiquities Authority who is one of the team leaders, told Live Science. The observation that Jerusalem was likely not the epicenter of the earthquake is based on the damage found in Jerusalem and other sites in the region.

Excavations reveal that after the destruction, people rebuilt the destroyed buildings and walls, Uziel said. The fact that the earthquake is mentioned in the bible is "a sign that [the earthquake] was likely quite traumatic," Uziel said.

Did it really happen?

Scholars not involved with the team's research were cautiously supportive of the team's conclusions. "The interpretation of the archaeologists sounds possible," said Israel Finkelstein, a professor emeritus of archaeology at Tel Aviv University in Israel. The team's study, including the interpretation of the pottery, has not been published in a peer-reviewed journal, Finkelstein cautioned; the team used that pottery to help date the earthquake. Finkelstein also said that the area in Jerusalem that was excavated needs to be studied by seismologists to firm up the case for a past earthquake.

Finkelstein noted that evidence for a large eighth-century B.C. earthquake can also be found at other sites in the region, including at Megiddo — a spot investigated by Finkelstein. About 15 years ago, a team of seismologists and archaeologists documented evidence for the earthquake at Megiddo, which "included tilted and fractured walls," said Finkelstein.

"I haven't seen the excavations, but it was quite expected that some damage triggered by the mid-eighth century [B.C.] earthquake would be found in Jerusalem," said Shmuel Marco, a professor of geophysics at Tel Aviv University who took part in the Megiddo earthquake study 15 years ago. "We found it in the ruins of the same age at Megiddo, and others reported it in other excavations and in the deep Dead Sea drilling." which suggests that the earthquake impacted a wide area.

The Jerusalem team's "interpretation seems reasonable to me," said Jason Radine, who is chair of the Department of Global Religions at Moravian University in Bethlehem, Pennsylvania. He noted that the Hebrew Bible mentions that Jerusalem was attacked around the 790s or 780s B.C. by Israel (which at the time was a separate kingdom from Judah). However, "such an attack might leave a burn layer, which the excavators point out is not present in their find, "suggesting that an earthquake is the more likely cause of the destruction, Radine said.

Thomas Levy, who is a distinguished professor of Archaeology at the University of California, San Diego, also thought the damage was likely caused by an earthquake and that a strong case can be made that this earthquake is the same one mentioned in the bible. "When the biblical data is coupled with the archaeological and paleo-seismic data from the southern Levant, a strong correlation is clearly seen between the Book of Amos, a prophet in the Hebrew Bible, and the archaeological record," Levy told Live Science.

The team's research will be presented in September at the "City of David Research" conference.

Please visit the site: <https://www.livescience.com/biblical-earthquake-jerusalem-found.html>

CANADIAN ARCHEOLOGIST DEVOTES LIFE TO HISTORY OF SOUTHERN TURKEY

Dedicating his life to tracing the history of humanity, Canadian archeologist Timothy Harrison has been conducting excavations at the archeological site of Tell Tayinat in the Reyhanlı district of Turkey's southernmost Hatay province since 2004. A tell refers specifically to an ancient mound in the Middle East composed of the remains of successive settlements.

The archeologist from Toronto University, who obtained his doctorate from the University of Chicago, has unearthed numerous artifacts over the 17 years he has been working in these Anatolian lands. He has spent almost four decades conducting archaeological field studies in countries of the Levant, which in addition to Turkey would also include Syria, Israel, Lebanon and Jordan.

Harrison visits Turkey each season to excavate and conducts meticulous work with his team to unearth findings that can shed light on history. Among the artifacts that Harrison and his team have unearthed at Tell Tayinat are two statues that are 1.5 meters (4.9 feet) in length belonging to King Suppiluliuma and his wife from the Late Hittite Empire period of the 9th century B.C.

The professor told Anadolu Agency (AA) that he took part in excavations around the world during his 35-year career and said he takes great pride in presiding over excavations in Tell Tayinat.

Noting that his team has recovered numerous artifacts ranging from treaty cuneiform tablets to statues, he said archeologists and students from Turkey, the U.S., U.K., Germany, Belgium, France and the Middle East also participate in excavations.

"As a result of our meticulous works, we have unearthed temples, statues, palaces among other innumerable artifacts," he said. "If ceramics, botanical findings, organic residuals are counted too, the number of findings amount to thousands."

Some of these finds are on display at the Hatay Archaeological Museum, while others are kept in the excavation stores, according to Harrison.

The archaeologist said he wants to participate in excavations in Tell Tayinat as long as he lives. "Only little of the mysteries and artifacts on this tell have been unearthed yet. The excavations here will continue for many years."

He also said King Suppiluliuma's palace is believed to have been under a factory in the area, and the team wants to uncover the palace during upcoming excavations.

Please visit the site: <https://www.dailysabah.com/arts/canadian-archeologist-devotes-life-to-history-of-southern-turkey/news>

IN THE BALKANS, ONLINE RESOURCES FUEL THE ILLEGAL ANTIQUITIES TRADE, BY DAVID KLEIN

Social media tools and a lack of interest by law enforcement has boosted the illegal antiquities trade in the area of former Yugoslavia and the wider regions of the Western Balkans according to a new study published in the Journal of Computer Applications in Archaeology.

The decade of war which tore the region apart in the 1990s, also gave a boost to the Illegal antiquities trade. (source: Wikimedia Commons)“The perception that art and antiquities can be cheaply purchased or easily stolen or smuggled or trafficked can do serious political damage to the societies where those things happen,” the study by criminologist Sam Hardy explained.

One tangible example of that is a scandal which broke in December last year when it was revealed that an Eastern Orthodox icon gifted to Russian Foreign Minister Sergei Lavrov by a Bosnian Serb politician was in fact smuggled out of war torn regions of Ukraine.

The Balkan states position between Middle East conflict zones and Western Europe makes it a natural transit route for traffickers, however, the illegal artifacts that pass through former Yugoslavia don't just come from outside. There's no shortage of looting of local sites as well.

“It's one of those places where there are archaeological remains from a lot of societies that are interesting to powerful collectors in more powerful countries,” Hardy told the OCCRP. “It's clear that lots of stuff is coming out of the ground as well as the material which is being funneled through the country.”

Archaeologists in the region know that fact well, as they've come into conflict with the traffickers in the course of their work.

“As elsewhere in the Balkan-Eastern Mediterranean region(s), so in former Yugoslavia, archaeologists are threatened by looters and there have been ‘physical clashes’ between looters and archaeologists,” the study said. “Organised crime groups who also handle drugs and arms, have been involved in cultural property crime in former Yugoslavia for decades.”

The illegal antiquities trade is a multi-billion dollar global industry according to a 2018 report by Standard Chartered Bank,

“You cannot look at it separately from combating trafficking in drugs and weapons. We know that the same groups are engaged, because it generates big money,” said Catherine de Bolle, Executive Director of Europol after a major crackdown on the illegal antiquities in May of 2020.

The decade of war which tore the region apart in the 1990s, also gave a boost to the trade.

“There is evidence of participation of members or former members of armed forces and paramilitary organisations in theft and looting and members or former members of security agencies and political parties in trafficking of cultural goods during and after the wars in former Yugoslavia,” according to the report.

The looting of cultural property from active war zones is considered a war crime under the 1954 Hague Convention.

However in comparison to other types of trafficking often performed by the very same groups, law enforcement has been notably lax.

“Police officers are notorious as collectors of antiquities and protectors of ‘untouchable’ dealers and looters,” Hardy’s study said.

“Meanwhile, politicians, politically-exposed persons and other members of the political/business elite are notorious for assembling private collections of looted antiquities, to launder dirty assets and to accumulate social capital.”

While police turn a blind eye, looters and traffickers often hawk their illicit goods almost out in the open on public sites like Facebook, Ebay and Instagram as well as local sites.

It’s not unique to the Balkans, but online forums have allowed local criminals to learn from counterparts around the world.

“Online communities offer encyclopaedic knowledge, peer-to-peer learning/training, partnerships, supply chains,” Hardy said. “They can constitute real networks/groups and real source-to-market supply chains.”

According to Hardy, real solutions require changes in law enforcement not just in source countries but also in the wealthy market countries of western Europe and the U.S.

“Reform within source countries must be accompanied by reform within market countries, or the socio-economic harm that is done to source countries by market countries will continue – and will continue to be accompanied by socio-political harm,” the study said.

Please visit the site: <https://www.occrp.org/en/daily/14997-in-the-balkans-online-resources-fuel-the-illegal-antiquities-trade>

ANCIENT RELIEF DISCOVERED IN NORTHWESTERN TURKEY, BY MIRAC KAYA

Dating back to 5th century BC, relief depicting Greek-Persian wars unearthed in excavations of Dascylium ancient city

BALIKESIR, Turkey

Archeologists in northwestern Turkey discovered a relief on Monday depicting a war between the Greeks and Persians from the fifth century B.C.

The figures on the relief show fighting Greek soldiers beneath the hoofs of Persian warhorses, said archeologist Kaan Iren, who leads the dig site of the ancient city of Dascylium found in the modern-day Bandirma district of Balikesir province.

"Here is a scene of propaganda under the pretext of war. We can say these reliefs are a scene from the Persian-Greek wars," Iren told Anadolu Agency.

He added: "We think these reliefs were probably made for propaganda purposes during the wars."

Iren, who has been working at the excavation site in Dascylium with a team of 30 people since June 22, said they had unearthed parts of a stone and mudbrick wall dating back to the eighth century B.C. this year.

"Of the eighth-century-B.C. wall left from the Phrygian age, this year we unearthed an area of four meters (13.1 feet) high and 40 meters long. We think this wall, which was made of stone and mudbrick with the mudbrick parts having disappeared over time, was seven or eight meters high," said Iren, who is also a faculty member of the Mugla Sitki Kocman University.

The five-meter-wide wall is believed to have been built by the ancient Phrygian civilization to protect its territory, he said.

Iren noted that the discovery of the relief during the excavations of the wall surprised the team and became one of the season's most significant discoveries.

* Writing by Dilan Pamuk in Ankara

Please visit the site: <https://www.aa.com.tr/en/culture/ancient-relief-discovered-in-northwestern-turkey/2336764>

RESHAPING PREVIOUS IDEAS ON THE STORY OF CIVILISATION, GOBEKLI TEPE IN TURKEY WAS BUILT BY A PREHISTORIC PEOPLE 6,000 YEARS BEFORE STONEHENGE, BY ANDREW CURRY

ANCIENT ENGINEERING MARVELS

An immense mystery older than Stonehenge

When German archaeologist Klaus Schmidt first began excavating on a Turkish mountaintop 25 years ago, he was convinced the buildings he uncovered were unusual, even unique.

Atop a limestone plateau near Urfa called Gobekli Tepe, Turkish for "Belly Hill", Schmidt discovered more than 20 circular stone enclosures. The largest was 20m across, a circle of stone with two elaborately carved pillars 5.5m tall at its centre. The carved stone pillars – eerie, stylised human figures with folded hands and fox-pelt belts – weighed up to 10 tons. Carving and erecting them must have been a tremendous technical challenge for people who hadn't yet domesticated animals or invented pottery, let alone metal tools. The structures were 11,000 years old, or more, making them humanity's oldest known monumental structures, built not for shelter but for some other purpose.

The structures were 11,000 years old, or more, making them humanity's oldest known monumental structures

After a decade of work, Schmidt reached a remarkable conclusion. When I visited his dig house in Urfa's old town in 2007, Schmidt – then working for the German Archaeological Institute – told me Gobekli Tepe could help rewrite the story of civilisation by explaining the reason humans started farming and began living in permanent settlements.

The stone tools and other evidence Schmidt and his team found at the site showed that the circular enclosures had been built by hunter-gatherers, living off the land the way humans had since before the last Ice Age. Tens of thousands of animal bones that were uncovered were from wild species, and there was no evidence of domesticated grains or other plants.

Schmidt thought these hunter-gatherers had come together 11,500 years ago to carve Gobekli Tepe's T-shaped pillars with stone tools, using the limestone bedrock of the hill beneath their feet as a quarry.

Situated in modern-day Turkey, Gobekli Tepe is one of the most important archaeological sites in the world (Credit: Michele Burgess/Alamy)

Carving and moving the pillars would have been a tremendous task, but perhaps not as difficult as it seems at first glance. The pillars are carved from the natural limestone layers of the hill's bedrock.

Limestone is soft enough to work with the flint or even wood tools available at the time, given practice and patience. And because the hill's limestone formations were horizontal layers between 0.6m and 1.5m thick, archaeologists working at the site believe ancient builders just had to cut away the excess from the sides, rather than from underneath as well. Once a pillar was carved out, they then shifted it a few hundred metres across the hilltop, using rope, log beams and ample manpower.

Schmidt thought that small, nomadic bands from across the region were motivated by their beliefs to join forces on the hilltop for periodic building projects, hold great feasts and then scatter again. The site, Schmidt argued, was a ritual centre, perhaps some sort of burial or death cult complex, rather than a settlement.

That was a big claim. Archaeologists had long thought complex ritual and organised religion were luxuries that societies developed only once they began domesticating crops and animals, a transition known as the Neolithic. Once they had a food surplus, the thinking went, they could devote their extra resources to rituals and monuments.

Gobekli Tepe, Schmidt told me, turned that timeline upside down. The stone tools at the site, backed up by radiocarbon dates, placed it firmly in the pre-Neolithic era. More than 25 years after the first excavations there, there is still no evidence for domesticated plants or animals. And Schmidt didn't think anyone lived at the site full-time. He called it a "cathedral on a hill".

More than 25 years after the first excavations there, there is still no evidence for domesticated plants or animals.

If that was true, it showed that complex ritual and social organisation actually came before settlement and agriculture. Over the course of 1,000 years, the demands of gathering nomadic bands together in one place to carve and move huge T-pillars and build the circular enclosures prompted people to take the next step: to regularly host large gatherings, people needed to make food supplies more predictable and dependable by domesticating plants and animals. Ritual and religion, it seemed, launched the Neolithic Revolution.

The next day, I drove with Schmidt to the hilltop before dawn. I wandered, mystified and awestruck, among the pillars as Schmidt, his head wrapped in a white cloth to protect it from the blazing sun, oversaw a small team of German archaeologists and workers from the small village down the road.

Schmidt had just published his first reports on Gobekli Tepe the year before, setting the small world of Neolithic archaeology experts abuzz. But the site still had a sleepy, forgotten feel, with excavation areas covered by makeshift corrugated steel roofs and potholed dirt roads winding up to the mountaintop dig site from the valley below.

Schmidt's take on the site's striking T-pillars and large, round "special buildings" captivated colleagues and journalists when they were first published in the mid-2000s.

Breathless media reports called the site the birthplace of religion; the German magazine Der Spiegel compared the fertile grasslands around the site to the Garden of Eden.

Soon, people from around the world were flocking to see Gobekli Tepe for themselves. Within a decade, the hilltop was totally transformed.

Until the civil war in nearby Syria disrupted tourism in the region in 2012, work on the site often slowed to a crawl as busloads of curious tourists crowded around open excavation trenches to see what some were calling the world's first temple and made it impossible to manoeuvre wheelbarrows on the narrow paths.

Over the past five years, the mountaintop on the outskirts of Urfa has been reshaped once again. Today, roads and car parks and a visitor's centre can accommodate curious travellers from around the world. In 2017, corrugated steel sheds were replaced by a state-of-the-art, swooping fabric-and-steel shelter covering the central monumental buildings. The Şanlıurfa Archaeology and Mosaic Museum, built in 2015 in central Urfa, is one of Turkey's largest museums; it features a full-scale replica of the site's largest enclosure and its imposing T-pillars, allowing visitors to get a feel for the monumental pillars and examine their carvings up close.

In 2018, Gobekli Tepe was added to the Unesco World Heritage register, and Turkish tourism officials declared 2019 the "Year of Gobekli Tepe", making the ancient site the face of its global promotion campaign. "I still remember the site as a remote place on a mountaintop," said Jens Notroff, a German Archaeological Institute archaeologist who began working at the site as a student in the mid-2000s. "It's changed completely."

Schmidt, who died in 2014, didn't live to see the site's transformation from dusty mountaintop dig to major tourist attraction.

But his discoveries there spurred global interest in the Neolithic transition – and in the last few years, new discoveries at Gobekli Tepe and closer looks at the results of earlier excavations are upending Schmidt's initial interpretations of the site itself.

Work on foundations needed to support the site's swooping fabric canopy required archaeologists to dig deeper than Schmidt ever had.

Under the direction of Schmidt's successor, Lee Clare, a German Archaeological Institute team dug several "keyhole" trenches down to the site's bedrock, several metres below the floors of the large buildings. "We had a unique chance," Clare said, "to go look in the lowest layers and deposits of the site."

New discoveries at Gobekli Tepe and closer looks at the results of earlier excavations are upending Schmidt's initial interpretations of the site

What Clare and his colleagues found may rewrite prehistory yet again.

The digs revealed evidence of houses and year-round settlement, suggesting that Gobekli Tepe wasn't an isolated temple visited on special occasions but a rather a thriving village with large special buildings at its centre.

The team also identified a large cistern and channels for collecting rainwater, key to supporting a settlement on the dry mountaintop, and thousands of grinding tools for

processing grain for cooking porridge and brewing beer. "Gobekli Tepe is still a unique, special site, but the new insights fit better with what we know from other sites," Clare said. "It was a fully-fledged settlement with permanent occupation. It's changed our whole understanding of the site."

Meanwhile, Turkish archaeologists working in the rugged countryside around Urfa have identified at least a dozen other hill-top sites with similar – if smaller – T-pillars, dating from around the same time period. "It's not a unique temple," said Austrian Archaeological Institute researcher Barbara Horejs, an expert on the Neolithic who was not part of the recent research efforts. "That makes the story much more interesting and exciting." Turkish Culture and Tourism Minister Mehmet Nuri Ersoy went as far as saying that this area could be referred to as the "pyramids of south-east Turkey".

Rather than a centuries-long building project inspiring the transition to farming, Clare and others now think Gobekli Tepe was an attempt by hunter-gatherers clinging to their vanishing lifestyle as the world changed around them. Evidence from the surrounding region shows people at other sites were experimenting with domesticated animals and plants – a trend the people of "Belly Hill" might have been resisting.

Clare argues the site's stone carvings are an important clue. Elaborate carvings of foxes, jaguars, serpents and vultures covering Gobekli Tepe's pillars and walls "aren't animals you see every day," he said. "They're more than just pictures, they're narratives, which are very important in keeping groups together and creating a shared identity."

When I first wandered across the site more than 15 years ago, I remember a feeling of great distance. Gobekli Tepe was built 6,000 years before Stonehenge, and the exact meaning of its carvings – like the world the people there once inhabited – is impossible to fathom.

That, of course, is part of the Gobekli Tepe's tremendous magnetism. As thousands of visitors marvel at a place most people had never heard of a decade ago, researchers will continue trying to understand why it was built in the first place. And each new discovery promises to change what we now know about the site and the story of human civilisation.

"The new work isn't destroying Klaus Schmidt's thesis; it stands on his shoulders," said Horejs. "There's been a huge gain of knowledge, in my view. The interpretation is changing, but that's what science is about."

Please visit the site: <https://www.bbc.com/travel/article/20210815-an-immense-mystery-older-than-stonehenge> [Go there for pix]

KHUFU'S SOLAR SHIPS: THE OLDEST ORGANIC ANTIQUITY IN THE WORLD

Khufu's Solar Ships were discovered by Egyptian archaeologist and journalist Kamal el-Malakh in 1954.

The discovery was made on May 26, 1954 inside two roofed pits at the base of the southern Pyramid of Khufu [Cheops], at the bottom of one of them was a dismantled vessel beautifully carved of cedar wood. The boat consisted of 1224 parts that were all found.

Funeral boats were used to transport the king's mummy to visit the holy sites of the God Osiris, including Abydos in the south and Boto in the north.

This is in addition to the fact that this type of boat was also used to transport the body of the king from his palace of residence to the cemetery where his pyramid is located.

Named the Solar Boat and the Ship of Khufu, it was known that such funerary ships sail to restore life for the deceased king from the holy places where the ships of the gods reside.

Egyptian myths say that sunrises on the far eastern shore; that's when Ra appears from the water and is greeted by a band of monkeys.

After that, Ra, the Sun God, rides in his day ship, which sails him across the sky until evening, when he moves from his day ship to the night ship that waits for him in the underworld.

Egypt's Ministry of Tourism and Antiquities transferred king Khufu's Solar Ship from its current location in the Pyramids' Archeological Area to its new display at the Grand Egyptian Museum on August 6.

During the transfer process - Social media Three national companies handled Khufu's Solar Ship transportation to the Grand Egyptian Museum.

Egypt's Ministry of Tourism & Antiquities performed all the necessary procedures to secure the ship during transportation. It took 6 months of workshops and meetings to discuss the most appropriate scientific method that ensures the ship's safety during packaging and transportation.

Khufu's ship was restored and assembled out of 1200 pieces of wood and has been displayed since then at the Solar Boat Museum near the Great Pyramid of Cheops.

Secretary General of the Supreme Council of Antiquities Mostafa Waziry headed the team responsible to transfer Khufu ship from its current location in the Pyramids' Archeological Area to the Grand Egyptian Museum.

Dazzling colors lit up the special vehicle that transferred Khufu's Ship to the Grand Egyptian Museum.

Khufu's ship was transferred to the Grand Egyptian Museum using the smart remote-controlled cart, which was specially brought in from Belgium to transport the whole ship without dismantling it.

Please visit the site: <https://www.egypttoday.com/Article/4/106718/Khufu-s-Solar-Ships-The-oldest-organic-antiquity-in-the> [See also story and brief video at <https://www.egyptindependent.com/video-king-khufus-first-boat-installed-safely-at-gem/>]

MINOANS' SOPHISTICATED DIET **INCLUDED IMPORTED SPICES FROM ASIA,** **BY PATRICIA CLAUS**

The Minoans were a remarkable people, with a civilization far advanced for its time in many ways, with artwork and palaces replete with riches beyond description; now we can see that their diet was as rich and varied as their physical culture, much of which survives to this day.

Evgenia Tsafou of the Aegean Interdisciplinary Studies Group of UC Louvain, and Juan José García-Granero of Oxford and of the Human Ecology and Archaeology Research Group of Barcelona, have published a new paper on this fascinating subject.

Appearing in the Journal of Archaeological and Anthropological Sciences, the new study builds on previous investigations into the diet of the Minoans by analyzing grains found in vessels at two Minoan sites on Crete, Sissi and Malia.

The cooking and storage pots in question were from the Minoans' "neopalatial," "final palatial" and "post-palatial" periods, representing the time from 1700 to 1100 BC.

There is much that had been unknown until recently about the Minoans, and their Greek-mainland counterparts the Mycenaeans — including their very origins. A paper published in the journal Nature in 2017 put much of these uncertainties to rest, showing that in fact their ancestors had been people from Neolithic western Anatolia and Greece, and modern Greeks are indeed descended from them.

The Minoan civilization, including Mycenaeans who lived on the Greek mainland, were the first literate societies of Europe. They are considered to be cultural ancestors of later Classical Greece.

Scholars now believe that the cataclysmic eruption of the volcano of Thera (the modern-day Greek island of Santorini) destroyed much of Minoan civilization and hastened its downfall.

The scientists' new findings shed light on just how advanced the Minoans were in every aspect of life when their civilization was at its peak, including their use of imported spices that had originated from Western Asia and something called "tiger nuts," which are roots cultivated in Egypt and elsewhere in Africa.

Tsafou and García-Granero found traces of these nuts, which are actually considered to be tubers, also known as nutsedge, with the scientific name of *Cyperus esculentus*. The Minoans made a nut bread from them

They were apparently cultivated as a staple in ancient Egypt and are still eaten raw or cooked, even now throughout parts of Africa and the Mediterranean region.

The remains were from the towns of Sissi and Malia, which were both continuously occupied from about 2,600 to 1,200 BC. Both had some palatial buildings, along with those occupied by ordinary people. The scientists state that the food samples collected show a full representation of the material culture of Minoan society at that time.

Naturally, the archaeologists also found traces of basic cereals such as wheat and barley, which were widely cultivated then as well.

Minoans ate locally-produced crops such as acorns, almond, elderberry, fig, grape, Mediterranean hackberry, olive, pear, pomegranate and terebinth, according to Tsafou.

Of course, the starch analysis undertaken by Tsafou doesn't include evidence of meats that Minoans are already known to have consumed, such as sheep, goats and some pork. In addition, she says, they would have hunted wild animals as well.

Minoan Linear B tablets have occasional references to herbs and condiments, but the only macro-botanical evidence of them until now has been exactly two coriander seeds, according to a report from Haaretz. However, Tsafou and García-Granero's new analysis also detected cumin in the Minoans' pots.

There has been little archaeological evidence found for using cumin in the prehistoric Aegean, but records do show its use there during the Bronze Age, where it was used in cooking; in addition, its oil was used in various traditional treatments that are purportedly medicinal in nature.

Tsafou and her colleagues found just a dash of cumin in the Minoan pots at the two towns. Finding these traces of the exotic spice — which grew in what is now India and Iran — came as a surprise because its presence has never been documented in any previous archaeobotanical materials from the Minoan civilization previously.

If there had been any of the spice detected before, the archaeologist says they would have been found as burned seeds.

A Linear B tablet from the Mycenaean palace of Pylos. This piece contains information on the distribution of bovine, pig and deer hides to shoe and saddle-makers. Linear B was the earliest Greek writing, dating from 1450 BC, an adaptation of the earlier Minoan Linear A script. The script is made up of 90 syllabic signs, ideograms and numbers. This and other tablets were fortuitously preserved when they were baked in the fire that destroyed the palace around 1200 BC. It is on display at the National Archaeological Museum of Athens. Credit: Sharon Mollerus /CC BY 2.0

The archaeological preservation of cumin seeds is so difficult because they are very tiny, but the recent study detected their presence; not only that, Tsafou and her colleagues determined that the precious spice, which must have been exceedingly expensive, had been used in cooked dishes.

The cumin used by Minoans may have been imported from the Eastern Mediterranean from Mycenae, on the Greek mainland, although it may have been directly imported to Crete itself. The archaeological record of human history has shown over and over again

that long-distance trading preceded recorded history, so the use of spices from faraway lands is absolutely not beyond the pale with the Minoans.

Cumin, according to a scholarly paper published by Israel's Bar-Ilan University was likely brought to the southern Levant by the Philistines — who, as we see from recent research, may have been of Greek origin themselves.

And, as other researchers found, the ancient maritime powerhouse Phoenicians were most likely responsible for importing the cinnamon from Southeast Asia to the Levant. Clearly, international spice trading was possible far back into antiquity; the presence of cumin in Minoan Crete now appears to be part of that ancient trade.

Rich and Varied Cuisine Part of Minoans' Luxurious Lifestyle Linear B tablets found on Crete have mentioned coriander, sesame seeds, fennel bulb, mint and parsley; clearly the Minoans ate well and sumptuously. Anyone who has seen the Minoan frescoes at the palace of Knossos has seen the striking figure of the women gathering saffron from crocuses, which are still widely cultivated in Greece.

Asked just how much credence we can give the information on these tablets, Tsafou says "It is very secure and accepted in the research community that the interpretation is correct and that Linear B is the ancestor of the Greek language, used by the Mycenaeans."

Linear B was the writing system used on the mainland of Greece and Crete during the Bronze Age; it was first deciphered in 1953 by cryptographer Michael Ventris, after groundwork laid down by Brooklyn College classicist Alice Kober.

Ventris declared Linear B indeed was the written form of an early permutation of the Greek language. Now, linguist Dr. Esther Salgarella has made the link between Linear A and Linear B as a result of her new analysis.

Linear A script carried over into Linear B Minoans used a crude syllabic system known as Linear A from about 1800 to 1450 BC. Over one thousand tablets written in Linear A have been found.

Around 1,600 BC, Linear A was borrowed from the Minoans by the Mycenaean Greeks and Linear B is the Greek Mycenaean dialect, used in administration of not only the Mycenaean palaces of Crete but also in Thebes, Mycenae, Pylos and Tiryns on the Greek mainland.

Parallels between signs in Linear A and B have indeed been identified before, but Dr. Salgarella has now shown that a great many graphic variants of signs in the Minoan script were carried into Linear B.

Tragically, in approximately 1200 BC the great civilizations around the Mediterranean became nearly extinct, perhaps as a result of the eruption of the volcano Thera, with cataclysmic effects on their population and cultural systems. Both systems of writing had become extinct by approximately 1100 BC.

We have two archaeologists to thank for much of what we know about the Minoans today. Amateur archaeologist Heinrich Schliemann, who discovered Troy, was certain that a major Minoan palace lay hidden near Heraklion, but the Ottoman authorities who still ruled Crete at the time denied any permission to dig there.

Years afterward, the British archaeologist Arthur Evans, inspired by Schliemann's ideas, reached Crete to negotiate the purchase of a portion of land in Knossos.

He began excavations in 1900 and in a matter of days, he found enough clear evidence to indicate the presence of a huge palatial complex.

Controversial restoration works took place thanks to Evans' personal ownership of the site. He was the one responsible for naming the civilization "Minoan" after the legendary king Minos of Greek mythology

Please visit the site: <https://greekreporter.com/2021/08/19/minoans-sophisticated-diet-included-imported-spices-from-asia/> [Go there for pix]

BREAKTHROUGH TECHNIQUE DETECTS **MAGNETIC FIELD HISTORY IN** **PREHISTORIC STONE TOOLS,** **BY RUTH SCHUSTER**

And we can relax: The Earth's magnetic field may be weakening now but it's happened before, and it recovered

Among the things we take for granted is Earth's magnetic field, which among other things protects us from harmful radiation. But it is a fickle beast. It fluctuates, it intensifies and weakens, the poles move – and let's not even discuss their tendency to flip. Since the magnetic field protects life-forms from hazardous solar radiation, the more we know about the magnetic field's vagaries, the better.

Now a breakthrough study led by Prof. Erez Ben-Yosef at Tel Aviv University has discovered details on the magnetic field in the Middle East 10,000 to 8,000 years ago – using not only pottery, which is the usual way to study the magnetic field in the Neolithic period, but burned flints. The study was published in PNAS.

The pottery and burned flints in question, 129 of them all told, were from archaeological sites in Wadi Feynan, Jordan.

“Wadi Feynan is extremely rich in well-dated sites from this period, so we could test the entire Neolithic in a single region (pre-pottery to Pottery Neolithic),” Ben-Yosef explains.

In the Middle East, the “pottery Neolithic” goes back about 8,500 years, though in eastern Asia it goes back as much as 20,000 years (which indicates that hunter-gatherers did use pottery after all). In any case, the beauty of this new technique is that it may help us study the magnetic field very precisely going back hundreds of thousands of years, to the dawn of early humans tossing flints into the fire to work them more easily, Ben-Yosef says.

How do clay pots in fact preserve information about the magnetic field? Much the same way basalt ejected in volcanic eruptions does.

The rock, or clay, contains iron minerals. When heated, whether in the bowels of the Earth or a kiln, the electrons in the ferromagnetic minerals align with the magnetic field at the moment. Think what happens when you throw iron chips at a magnet: they align.

So, the alignment of the ferromagnetic minerals in volcanic rock, or pottery, or burned flints, can show where the poles were at the moment of firing. What about the magnetic field's intensity? Scientists deduce that based on a series of experiments – which take several weeks, Ben-Yosef points out – in which they gradually replace the magnetic signal in the artifact (be it clay or a burned stone ax) with signals acquired in known magnetic fields in the lab. Mathematics is involved.

The upshot of their study shows that like pottery, when the flint is burned, it records the intensity of the magnetic field at the time of burning, the professor explains. “Flint was deliberately heated in order to produce tools. Say, 50,000 years ago somebody used fire to make tools; and the flint acquired the signal of the magnetic field of the time.”

Theoretically, this technique should be applicable up to about 400,000 years ago, which is when, some archaeologists are starting to think, control of fire was achieved and began to spread.

The technique of detecting the magnetic field at the time a flint was burned is the brainchild of Ben-Yosef with Anita Di Chiara of Rome’s National Institute of Geophysics and Volcanology, Lisa Tauxe, Thomas Levy, Mohammad Najjar and Fabio Florindo.

In previous work, Ben-Yosef and his colleagues worked on magnetic field “signals” in clay pots around 3,000 years old that had been made in and around Jerusalem. Their work demonstrated that pottery can be dated using its magnetic field “signal.” Now his work shows that when archaeologists are studying a site that features burned flints, they will be able to elucidate their magnetic intensity in the lab and compare it with a database – assuming there is a database – and know when in prehistory this tool was made, he says.

For the purposes of research on magnetic fluctuations and flips, archaeology has a huge advantage over geology: the time resolution, the researchers point out. Dating in geology is on the scale of thousands of years at best. Archaeological artifacts can usually be dated at a resolution of centuries or even tens of years, or even, sometimes, given an exact date. The fact that pottery was only invented 8,500 years ago (in the Middle East at least) was a constraint; now, the discovery that burned flints can also serve the purpose of detecting magnetic field mayhem enormously widens potential research.

Worry not about the magnetic field

If the magnetic field flips on us again, all bets are off – separate research suggests that field flips have been associated with climatic chaos and extinctions. For instance, about 42,000 years ago, the planetary magnetic field weakened and then, within about a thousand years, it flipped. During this time the ozone layer in the atmosphere was depleted and altogether the events drove global climatic and hence environmental changes. But the fact that it’s been demonstrably weakening of late need not cost you sleep, Ben-Yosef’s research on the prehistory of the magnetic field indicates.

Why the magnetic field fluctuates and flips is not clear. “The magnetic field is generated by processes that take place below a depth of approximately 3,000 kilometers [1,865 miles] beneath the surface of the planet (for the sake of comparison, the deepest human drilling has reached a depth of only 20 kilometers),” Ben-Yosef says.

The magnetic field protects the planet from the continued bombardment by cosmic radiation and thus allows life as we know it to exist; it is volatile and its strength and direction are constantly shifting, and it is connected to various phenomena in the atmosphere and the planet’s ecological system, including affecting the climate in ways we don’t really understand yet. Nevertheless, the magnetic field’s essence and origins

have remained largely unresolved. "In our research, we sought to open a peephole into this great riddle," the researchers say.

And what do we see through that peephole? Not much yet, but they can say that about 7,600 years ago, during the Neolithic, the field spiked downward, as it were, marking the weakest values ever recorded in the last 10,000 years. Happily, it quickly rebounded.

In fact, in his previous work, Ben-Yosef demonstrated using the Jerusalem pottery that there was a massive, anomalous spike about 2,800 years ago, after which the magnetic field lost 27 percent of its strength over 30 years. Then it gently waned from the sixth to the second century B.C.E., spanning the Iron Age through the Hellenistic era in Judea.

And now, in our time, since measurements began less than 200 years ago, we have seen a continuous decrease in the field's strength, Prof. Tauxe says. "This fact gives rise to a concern that we could completely lose the magnetic field that protects us against cosmic radiation and, therefore, is essential to the existence of life on Earth," she said. "The findings of our study can be reassuring: This has already happened in the past. Approximately 7,600 years ago, the strength of the magnetic field was even lower than today, but within approximately 600 years, it gained strength and again rose to high levels."

Please visit the site: <https://www.haaretz.com/archaeology/.premium-breakthrough-technique-detects-magnetic-field-in-prehistoric-stone-tools-1.10125401> [Go there for pix]

3500-YEAR-OLD CERAMIC OVEN FOUND IN TURKEY'S TEPECİK MOUND

A ceramic oven dating back 3500 years was unearthed in Tepecik Mound in western Aydın province's Çine district.

Excavations at Tepecik Mound, which is located among olive trees and cornfields on the Çine Plain, have been carried out under the presidency of professor Sevinç Günel of Hacettepe University's archaeology department since 2004.

As part of the 17-year works in the archaeological site, which was known as a trade center in the past, three towers, a room featuring the items used by the rulers of the period for official visits, and obsidian used in tool making were also unearthed. Archaeologists recently have unveiled an oven with ceramic tiling in the mound.

Speaking to Anadolu Agency (AA), excavation head Günel said that the region hosted settlements back-to-back for 7,500 years. Noting that they found traces of life from every period in the mound, Günel emphasized that this proved that the region was a strong economic center in its geography.

“The area where we have been recently working has architectural remains and finds from 3,500 years ago. We think it is a ceramic oven.

It has ceramic pieces on its tiling and a hard-filled mud brick floor.

There are also ceramic pots around it. We have samples of these pots that prove mass production was conducted here. We will have clearer information as our work will spread in the area more in the upcoming days.”

Stating that they also found a warehouse 20 meters (65 feet) away from the area of the oven, Günel said, “We found broken pieces of jars and vessels containing products in this warehouse. However, it was heavily damaged. The reason for such damage was a flood that occurred at that time. Recently we have been cleaning the broken pots in the area.”

Please visit the site: <https://www.dailysabah.com/arts/3500-year-old-ceramic-oven-found-in-turkeys-tepecik-mound/news> [Go there for pix]

‘GENETIC FOSSIL’: INTACT DNA FROM WOMAN WHO LIVED 7,200 YEARS AGO DISCOVERED IN INDONESIA, BY DONNA LU

Archaeologists have discovered ancient DNA in the remains of a woman who died 7,200 years ago in Indonesia, a find that challenges what was previously known about migration of early humans.

The remains, belonging to a teenager nicknamed Bessé, were discovered in the Leang Panninge cave on the Indonesian island of Sulawesi. Initial excavations were undertaken in 2015.

The discovery, published in the journal *Nature*, is believed to be the first time ancient human DNA has been discovered in Wallacea, the vast chain of islands and atolls in the ocean between mainland Asia and Australia.

The DNA was extracted from the petrous part of Bessé’s temporal bone, which houses the inner ear.

Griffith University’s Prof Adam Brumm, who co-led the research, said the intact DNA was a rare find.

“The humid tropics are very unforgiving on DNA preservation in ancient human bones and teeth,” Brumm said.

“There’s only one or two pre-neolithic skeletons that have yielded ancient DNA in all of mainland south-east Asia.

“Elsewhere in the world – in the northern latitudes of Europe, in America – ancient DNA analysis is completely revolutionising our understanding of the early human story: the genetic diversity of ancient humans, population movements, demographic history.”

The researchers describe Bessé as a “genetic fossil”. Genetic sequencing showed she had a unique ancestral history not shared by anyone living today, nor any known humans from the ancient past, Brumm said.

Around half of Bessé’s genetic makeup is similar to present-day Indigenous Australians and people from New Guinea and the Western Pacific islands.

“Her ancestors would have been a part of the initial wave of movement of early humans from mainland Asia through these Wallacean islands towards what we today call Sahul, which was the combined ice age landmass of Australia and New Guinea,” Brumm said.

Toalean stone arrowheads. Bessé remains were found alongside prehistoric tools and red ochre. Photograph: Shahna Britton and Andrew Thomson

Surprisingly, Bessé's DNA also showed an ancient link to east Asia, which challenges what was previously known about the timeline of migration to Wallacea.

“It is thought that the first time people with predominantly Asian ancestry entered the Wallacean region was around about three or four thousand years ago, when the first prehistoric neolithic farmers entered the region from Taiwan,” Brumm said.

“If we're finding this Asian ancestry in a hunter-gatherer person who lived thousands of years before the arrival of these neolithic people from Taiwan, then it suggests ... earlier movement of some population from Asia into this region.”

Bessé is also the first known skeleton belonging to the Toalean culture, a group of hunter-gatherers who lived in South Sulawesi between 1,500 and 8,000 years ago.

She was around 17 to 18 years old at the time of burial. Prehistoric stone tools and red ochre were found alongside her remains. Her grave also contained bones of hunted wild animals.

Please visit the site: <https://www.theguardian.com/science/2021/aug/26/genetic-fossil-intact-dna-from-woman-who-lived-7200-years-ago-discovered-in-indonesia?fbclid=IwAR2Dg6srqrNZfkB2WFz7VbtIB-uEfdGWhJhRJC0nbld3Sy2uuJTpuHQ73vY>

SKULL OF FIRST BRAIN SURGERY PATIENT RECONSTRUCTED IN AŞIKLI HÖYÜK

With the 3D reconstruction of the skull of a young woman who underwent the world's first brain surgery, Aşıklı Höyük will attract a huge number of history enthusiasts to the Cappadocia region

A skull of a young woman who underwent brain surgery was found in Turkey's Aşıklı Höyük during the excavations conducted in 1989. The skull of the woman on whom the operation was pioneered will be reconstructed via a new project utilizing beeswax.

Aşıklı Höyük, located in Kızılkaya village of Aksaray province's Gülağaç district, is a prehistoric mound of great importance and the first known village in Central Anatolia where hunters, gatherers and nomads settled.

A burial site in Aşıklı Höyük, Aksaray, central Turkey, August 25, 2021. (AA Photo)

The first comprehensive study was launched by Ian Todd in Aşıklı Höyük a year after Hittitologist Edmund Gordon found the settlement in 1963.

The excavations were carried out by the Istanbul University Prehistory Department in 1989. A number of crucial discoveries have been made in the region since the excavations were launched. Thanks to the excavations, the process of transition from nomadic to sedentary lifestyles can be observed step by step in the region today.

Bearing traces of a 10,400-year-old past, the mound witnessed the first examples of many activities in history, including the domestication of sheep and goats and agricultural experiments.

Moreover, a first in the history of medicine was realized here: The first brain surgery in the world was performed on a young woman.

The settlement is keen on drawing tourists by offering them a journey through its thousands of years of history. The reconstruction project of the young woman's skull featuring the traces of brain surgery is the latest project to draw tourists to the settlement. It is expected that the skull replicated as a 3D beeswax model will attract history enthusiasts.

Aksaray Museum Director Yusuf Altın told Anadolu Agency (AA) that there were two holes in the skull that revealed the first brain operation in history.

Noting that the average age of people was 30-35 in the period 9,500 years ago, Altın said: "From the studies carried out on the skull, scientists determined that the woman who underwent the operation lived for about 10 days after the operation. After permission from the Ministry of Culture and Tourism, Aksaray Municipality started a fleshing study project on the skull, which is exhibited at the Aksaray Museum. We had a 3D scan of the skull done. Two beeswax models of this skull's scanned version will be made and exhibited in Aksaray Science Center."

The beeswax figures will be prepared in Germany.

Istanbul University Faculty of Letters, department of prehistoric archeology lecturer and Aşıklı Höyük excavation head, professor Mihriban Özbaşaran also pointed out that the excavations at Aşıklı Höyük started in 1989.

Stating that the work started as rescue excavation, Özbaşaran said, "Since that period, excavations have continued without interruption.

Agriculture and animal husbandry are the most important elements in the lifestyle of Central Anatolia today. We see that the very first people who were engaged in agriculture and animal husbandry lived here in the ancient period as well. The first settlement begins in the 8400s B.C."

The skull featuring the traces of brain surgery on display at Aksaray Museum, central Turkey, August 25, 2021. (AA Photo)

Özbaşaran said that the woman who underwent the brain surgery was buried with her baby.

"In the examinations at Hacettepe University, it was revealed that this skull was especially pierced and that the procedure was performed very sensitively. This was an operation performed using obsidian piercings. After the hole was made during the operation, you see a renewal of the cells in the skull. So it seems that the woman lived after the surgery, at least for a while."

"A new study is underway on the skull now. We will replicate it in 3D. We look forward to it, we will revive that woman with the project. We will meet the woman from Aşıklı Höyük," she added.

Please visit the site: <https://www.dailysabah.com/arts/skull-of-first-brain-surgery-patient-reconstructed-in-asikli-hoyuk/news> [Go there for pix]

OLDEST FLAX? NOT SO FAST: PREHISTORIC TURKISH TEXTILE WAS MADE OF OAK FIBER, BY RUTH SCHUSTER

New analysis shows textile made 8,500 years ago in the Neolithic town of Çatalhöyük wasn't made of imported flax but the inner bark of local oak trees

Woven textiles surviving from the dawn of civilization are rare – and, it turns out, sometimes controversial. Among the oldest known textiles are fragments found at the Neolithic site of Çatalhöyük in central Turkey. Now a report in *Antiquity* argues that in contrast to the initial assertion that they were made of flax imported from somewhere else, the textiles had been woven from the bast of local oak trees.

Resorting to the dictionary reveals that bast is a fibrous layer beneath the external bark. To this day, people use bast fiber for weaving baskets and textiles.

The revelation that the textile was made of oak bast resolves the mystery of why no flax seeds were found at Çatalhöyük, explain Antoinette Rast-Eicher of the University of Bern, Switzerland, with Sabine Karg of the Free University of Berlin and Lise Bender Jørgensen of the Norwegian University of Science and Technology. It also renders moot the theory that the ancient Çatalhöyükians had imported flax fiber from afar.

It also fits with previous studies showing that bast from lime, oak and willow trees was widely used in prehistoric Europe to make cord.

Neolithic textiles in general were made by twining, and later plain or tabby weaving threads. The threads at Çatalhöyük seem to have been manufactured by splicing, as opposed to retting and spinning.

“Strips of fibers were joined end to end, with the ends overlapping; these strips were then rolled together by hand to produce a yarn, and two such yarns were plied together,” Rast-Eicher and the team explain – techniques that they believe arose from the early methods to produce string from bast.

Here is a video on how to make tabby weave. It requires a loom.

The article also clarifies the Çatalhöyük textiles' age: about 8,700 to 8,500 years old. The 17 fragments of woven and twined textiles and 14 threads or strings are among the oldest in the Near East or Europe, though they are far from the oldest known.

Beyond fig leaves

We cannot know how far back weaving per se goes. It has even been postulated that Neanderthals, let alone early modern humans, may have been making clothing (rather than just wrapping themselves in pelts), based on the discovery that they could make three-ply cord 52,000 to 41,000 years ago. The ability to twist fiber into cord is a prerequisite of making fabric (be it for clothing, bags, shrouds or even boats). That

Neanderthal cord found in France knocked the previous record holder, string found in Ohalo, Israel, from 19,000 years ago, out of the ballpark. It would be a stretch to say the Neanderthals had discovered the fig leaf, but some of them did live in chilly climes.

Moving onto our species, in Moravia archaeologists found what seems to be impressions of complex textiles dating to 28,000 years ago – complex enough to suggest the technology had been invented much earlier. From much later but still jaw-dropping: archaeologists found actual rope and textile fragments in Guitarrero Cave, Peru, from 12,000 years ago; a pleated linen shirt found at Tarkhan, ancient Egypt, dating to 5,000 years ago; and a shred dyed with royal purple, no less, found in Israel from 3,000 years ago. Even tartan twilling goes back more than 3,000 years, and it wasn't invented in Scotland but in central Asia.

Weaving was also central to basket-making. In Israel, while searching for more Dead Sea Scrolls, archaeologists discovered a large, intricately woven basket buried in a cave in Wadi Murabba'at. It is complete and looks so perfect that one wouldn't think it old at all. But it proved to have been made about 10,500 years ago, according to the Weizmann Institute. The elaborate knotting technique shows this was no fledgling technology. In Çatalhöyük, archaeologists also found the imprints of coiled baskets made of grasses that served, among other things, to bury deceased infants. Signals of wear suggest the baskets were repurposed from general usage. Sometimes adults were buried wrapped in the reed mats.

Apropos Israel's Wadi Murabba'at, in a different cave, archaeologists found a comb (for weaving, not hair) that dated to 11,000 years ago, according to carbon dating. The string binding together the wooden teeth of the comb had been thought to have been made of flax. After being sent a bit of it, Rast-Eicher suspects it isn't: it also might be tree bast.

Dr. Naama Sukenik of the Israel Antiquities Authority said she has faith in the comb's original characterization by Tamar Schick.

“Very early strings and textiles have to be analyzed carefully,” Rast-Eicher sums up. “In many cases it is difficult, as bast fibers like flax or tree bast look very similar. Flax, and especially domesticated flax, stands for early farming,” she adds – hence the “competition” to find the first flax. To find flax as early as 9,500 years or 8,500 years ago would have been a real coup, she adds.

Mats but no doors

The Neolithic site of Çatalhöyük actually consists of two areas: the eastern village, which arose about 9,500 years ago, and the later Chalcolithic site of Çatalhöyük West, dating to almost 7,000 years ago. A river runs between them.

It has even been surmised that in Çatalhöyük – one of the world's earliest towns, with possibly as many as 8,500 people in its heyday – the folk were not only farming crops and husbanding livestock, but also assaulting one another.

The homes were built close together, in proto-row houses that were accessed through a hole in the roof. They had no doors, insofar as can be ascertained. And those densely packed homes had mats on their floors, a discovery made in 1963. But however pleasing

the mat rendered the floor underfoot, the crowding was likely stressful for peoples who had so recently descended from footloose hunter-gatherers, as one may infer from the fact that 25 of 93 skulls found at Çatalhöyük were fractured in life.

Once dead, the bodies were bound with cord into a tightly flexed position typical of many Neolithic burials, archaeologists say. Some were then wrapped in shrouds, especially the babies, the archaeologists write, or mats.

Apropos of the dead, among the surviving wall paintings at Çatalhöyük, archaeologists report in separate research on pictures of animals, hunting scenes – and birds devouring headless bodies. One possibility is this reflects their treatment of the dead. Among the finds in Çatalhöyük was a plastered skull – an artifact more familiar from the Neolithic Levant, on the other side of the Mediterranean. This skull was found cradled in the arms of an old woman. It is hard to know what to make of the removal, plastering and decoration of skulls some 9,500 years after the event, but one theory is these are the whispers of an ancestor cult that may have spread throughout the Middle East, and reached Anatolia as well – and perhaps contributed to the rise of the first complex societies in the region, which evidently doesn't mean they all got along.

Please visit the site: <https://www.haaretz.com/archaeology/oldest-flax-not-so-fast-prehistoric-turkish-textile-was-made-of-oak-fiber-1.10143525> [Go there for pix]

WORKSHOP OF PHEIDIAS IN ANCIENT OLYMPIA RESTORED, BY PHILIP CHRYSOPOULOS

Greece's Central Archaeological Council (KAS) has approved the restoration of the workshop of iconic ancient sculptor Pheidias in Ancient Olympia.

Pheidias, who lived from approximately 480 to 430 BC, who was also a painter and architect, is the creator of the Statue of Zeus at Olympia, one of the Seven Wonders of the Ancient World.

The brilliant polymath also designed the statues of the goddess Athena Parthenos inside the Parthenon on the Acropolis, and the Athena Promachos, a colossal bronze at the Propylaea.

The restoration of the workshop of Pheidias, which later was transformed into the Early Christian Basilica of Olympia, was approved by the KAS as part of the program to highlight the Roman phase of the archaeological site of Ancient Olympia.

Minister of Culture and Sports Lina Mendoni said in a press release that visitors will spend more time at Olympia after the restoration because of this highlighting of the Roman phase of the history of the site.

Site home to Roman era buildings

“The highlighting of the buildings of the Roman period – in addition to the protection of the monuments themselves – will give an extremely interesting picture of the archaeological site of Olympia,” the Ministry says.

“This will significantly increase the stay time of visitors. Today, most visitors limit their tour to the area of the sanctuary with the classical antiquities.

“With the completion of the program of highlighting the Roman phase of the Sanctuary of Ancient Olympia, the image of the archaeological site is expected to change radically, offering the visitor a more complete experience of the site and the different time periods, as reflected and presumed in the monuments of Olympia.”

The location of the building that housed Pheidias' workshop in Olympia has been identified by researchers, who also presume its continuous use from the classical to the Byzantine era.

Its history and elements discovered by German excavators certify the presence of the great sculptor there.

The study, organized and funded by the German Archaeological Institute, aims at the complete protection of the monument and the wider area.

The restoration proposal is to present the Byzantine building inside the building based on the elements it has from each phase as well as the architectural qualities that express individual elements of each phase.

The Central Archaeological Council, approving the study for the restoration of the early Christian phase, requested that the Classical phase of the building be highlighted to a greater extent, both internally and externally, in order to document all the surviving authentic material of the classical times.

The monument has been fully documented: All the stones from the south pillar, as well as the floor stones and other parts of the monument are kept in the Museum.

In total, 160 architectural pieces were documented, while on-site measurements were made using modern and traditional methods.

Pheidias' workshop located at center of Ancient Olympia

Pheidias' workshop is located in the very center of the archeological site of Olympia. The history of the monument begins in the classical era, in the third quarter of the fifth century BC, when Pheidias, after his work on the Acropolis of Athens, came to Olympia to build the statue of Olympian Zeus.

The building was autonomous originally. The Statue of Olympian Zeus was a colossal, seated figure of the god Zeus, approximately 13 meters (42 feet) high. It was sculpted by Pheidias around 435 BC and placed inside the Temple of Zeus, in the Sanctuary of Olympia.

It was one of the most magnificent monuments ever to be constructed in antiquity and was among the Seven Wonders of the World, until its final loss and destruction in the fifth century AD.

Over time, and during the Hellenistic era, smaller and larger buildings were gradually added in the immediate vicinity of the workshop, which finally ended up being part of a large building complex.

These buildings did not have the monumental character of the workshop. During the late Hellenistic period, between the 2nd century BC and 1st century AD, large-scale changes took place in the surrounding area of the workshop building.

During the Roman era, great changes took place not only in the building, but also in the surrounding area. Only the original layout of the building with the foreground and the main hall remained unchanged.

During the Byzantine era, between 435 and 451 AD, the most important building to be erected during those times, the imposing Christian church, was built on the ruins of the workshop.

The building type of the early Christian basilica was easily adapted to the rectangular shape of the existing building. The Basilica of Olympia is considered the oldest known early Christian church in the Ilia area.

Even though the excavations have provided important data, they brought about large-scale alterations of the early Christian phase. As can be seen from the observation of old drawings and photographs, many elements of the church were sacrificed to facilitate the research.

However, the documentation of the Byzantine elements by the older researchers and excavators, as early as 1877, allows for the correct restoration of the monument.

Please visit the site: https://greekreporter.com/2021/08/28/workshop-of-pheidias-in-ancient-olympia-to-be-restored/?fbclid=IwAR35Hajz98Lmc8uS9-b5Cb2TuqnFbMNmMT_LeoD5wHWyLhafgJv-UglSNDY
