



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

**ΔΟΙΚΗΤΙΚΟ  
ΣΥΜΒΟΥΛΙΟ:**

Γ. Φακορέλλης (πρόεδρος),  
Ι. Μπασιάκος (αντιπρόεδρος),  
Ε. Φιλιπάκη (γενική  
γραμματέας),  
Α. Οικονόμου (ταμίας),  
Μ. Παπαγεωργίου (ειδική  
γραμματέας),  
Μ. Καπαρού (μέλος),  
Ε. Κουλουμπή (μέλος)

**Πληροφορίες:**

Γ. Φακορέλλης (σύνταξη,  
επιλογή ύλης)  
**E-mail:** [yfacorel@uniwa.gr](mailto:yfacorel@uniwa.gr)

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

**BOARD:**

Y. Facorellis (president),  
I. Bassiakos (vice-president),  
E. Philippaki (general  
secretary),  
A. Oikonomou (treasurer),  
M. Papageorgiou (special  
secretary),  
M. Kaparou (member),  
E. Kouloumbi (member)

**Information:**

Y. Facorellis (editor)  
**E-mail:** [yfacorel@uniwa.gr](mailto:yfacorel@uniwa.gr)

# Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

**- Σεπτέμβριος 2022 -**

**Pay attention to your enemies, for they are the first to  
discover your mistakes.**

*(Antisthenes)*

# Newsletter of the Hellenic Society of Archaeometry

**- September 2022 -**

**Nr. 258**

## ΠΙΝΑΚΑΣ ΠΕΡΙΕΧΟΜΕΝΩΝ – TABLE OF CONTENTS

### ΣΥΝΕΔΡΙΑ – CONFERENCES/WORKSHOPS

24<sup>th</sup> Radiocarbon Conference and 10<sup>th</sup> <sup>14</sup>C & Archaeology Conference, Zurich,  
11 – 16 September 2022 ..... page 4

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

POSTDOCS: Azrieli International Fellowships in Israel ..... page 5

Term post for a remote computational astronomy researcher, The Shanati  
Project, Institute for the Study of the Ancient World, New York University .... page 6

### INTERNET SITES

Roman road construction .....page 8

### ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

ArchBulg 2022/2 + Supplement 3 open access, Issue 26, 2022/2 contents ..... page 9

Raw material choices and technical practices as indices of cultural change:  
Characterizing obsidian consumption at ‘Mycenaean’ Quartier Nu, Malia  
(Crete), by Tristan Carter and Vassilis Kilikoglou ..... page 10

Thin Section Petrography, Geochemistry and Scanning Electron Microscopy  
of Archaeological Ceramics, by Patrick Sean Quinn ..... page 11

### ΕΙΔΗΣΕΙΣ - NEWS RELEASE

Conserving Beirut’s shattered glass, by Philip Woods ..... page 14

Luxury digs: Sprawling 1,200-year-old mansion found in Israel’s Negev  
Desert ..... page 17

A solution for the Elgin marbles: Robot-carved replicas? Amid a global  
reckoning on colonialism and cultural supremacy, pressure is growing on the  
British Museum to return the sculptures to Greece, by Karla Adam ..... page 19

The mystery ancient toys puzzling archaeologists, by Amanda Ruggeri .....page 23

What Alexander the Great Really Looked Like, by Tasos Kokkinidis ..... page 29

Broken fortress discovered under 'mega-monument' burial mound in Cyprus,  
by Donavyn Coffey ..... page 31

The messages that survived civilization’s collapse, by Sophie Hardach ..... page 33

Archaeologists Say They Discovered Ancient Gladiator Tombs in Southern  
Turkey, by Sarah E. Bond ..... page 36

Antikythera mechanism: Ancient celestial calculator, by Owen Jarus ..... page 39

|   |                |
|---|----------------|
| What if the ancient Greeks and Romans actually had terrible taste? Antiquities reproduced in vivid color, now on view in ‘Chroma’ exhibition at the Met, may look garish to modern eyes, Review by Philip Kennicott ..... | <b>page 43</b> |
| Archaeologists Find Entreaty to St. Peter in Early Church by Sea of Galilee, by Ruth Schuster .....   | <b>page 46</b> |
| Turkey's underground city of 20,000 people, by Geena Truman .....   | <b>page 50</b> |
| Pompeii photos provide stunning new glimpse into middle-class life before Mount Vesuvius erupted .....  | <b>page 53</b> |
| First Roman military amphitheater discovered in Israel’s Armageddon, by Margaret Crable .....   | <b>page 55</b> |
| Israeli Replica of 2,400-year-old Ship Solves Ancient Mediterranean Mystery .   | <b>page 58</b> |
| Mediterranean countries take on archaeology project off Tunisian coast , by Rina Bassist .....  | <b>page 63</b> |
| DNA analysis shows Griffin Warrior ruled his Greek homeland .....   | <b>page 66</b> |
| Sweeping Genetic Study of Ancient Eurasians Reveals Thousands of Years of History .....   | <b>page 71</b> |
| Recent study conducted on Tutankhamun’s sandals reveal astonishing findings, by Mustafa Marie .....   | <b>page 74</b> |
| Falling waters of Euphrates, Tigris rivers reveal submerged archaeological sites, by Mohammed Hardan .....  | <b>page 75</b> |

---

---

## **ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS**

# **24<sup>TH</sup> RADIOCARBON CONFERENCE AND 10<sup>TH</sup> <sup>14</sup>C & ARCHAEOLOGY CONFERENCE, ZURICH, 11 – 16 SEPTEMBER 2022**

Dear all,

We would like to inform you that the detailed program for the 24<sup>th</sup> Radiocarbon and the 10<sup>th</sup> Radiocarbon & Archaeology Conferences is now available on our web page.

A general overview can be found at: [https://radiocarbon24.ethz.ch/?page\\_id=2412](https://radiocarbon24.ethz.ch/?page_id=2412)  
Daily programs are available by selecting a specific day under “Program (Mon-Fri)” in the “Program” menu item on our main page: <https://radiocarbon24.ethz.ch/>

The names of the invited speakers are highlighted with a blue background (daily program) or marked with an asterisk (program overview).

Individual abstracts can be viewed by clicking on the presentation code (e.g. T01\_0x) of the respective talk or poster.

An overview of all sessions can be found under the “Sessions” item in the Program menu. If you click on the session code (e.g., A01), you can view a collection of all abstracts for the selected session on this website, including both oral and poster presentations.

Clicking on the conference logo will take you back to the program overview.

We would like to remind you that all presenting authors have to register before Monday, August 15th, to confirm their presentation.

With kind regards,

Elisabetta Boaretto (Weizmann Institute)  
Irka Hajdas (ETH Zurich)  
Hans-Arno Synal (ETH Zurich)  
Joint Conference Chairs

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

**POSTDOCS: AZRIELI INTERNATIONAL  
FELLOWSHIPS IN ISRAEL**

The Azrieli International Postdoctoral Fellowship will open online applications for the 2023-24 academic year on September 1, 2022.

Applications must be submitted by November 15, 2022.

The fellowship – now open to applicants from around the globe – offers funding of approximately EUR 58,000 (ILS 188,000) for 24 postdocs per year. Azrieli Postdoctoral Fellows can conduct research in any academic discipline at eligible institutions in Israel.

Below you will find all relevant information for the application process. Please note that candidates are required to secure an academic sponsor prior to applying.

- Call for applications:

<https://azrielifoundation.org/fellows/callforapplications2023/>

- Fellowship guidelines:

<https://azrielifoundation.org/wp-content/uploads/2022/04/Guidelines-2023-24-Final.pdf>

- Application instructions

<https://azrielifoundation.org/wp-content/uploads/2022/05/ApplicationInstructions-final.pdf>

If you have any questions regarding the process, please don't hesitate to get in touch with us.

Dafna Frumer & the Azrieli team

---

**TERM POST FOR A REMOTE  
COMPUTATIONAL ASTRONOMY  
RESEARCHER, THE SHANATI PROJECT,  
INSTITUTE FOR THE STUDY OF THE  
ANCIENT WORLD, NEW YORK UNIVERSITY**

The Shanati Project of the Institute for the Study of the Ancient World, New York University, seeks to hire a Graduate Researcher, Astronomy, as a consultant to use software to output first lunar visibility data for ancient times in connection with our project's chronological reconstruction of the ancient Babylonian calendar.

Must be knowledgeable of solar system astronomy and open to working with historical datasets. The main task is to use Alcyone Software's "Planetary, Stellar, and Lunar Visibility" freeware to output accurate historical dates for first lunar visibility and convert the data in line with Shanati's data model. This position is overseen by Alexander Jones and will work collaboratively with David Danzig.

This position is a part-time consultancy for 3 months from 9/1/2022 to 11/30/2022 for 37 hours in total (average of 3.1 hours per week) and begins as soon as hiring is complete or at an agreed upon date.

Compensation is \$33 per hour, for a total of \$1,221. Work must be done remotely and not require technical or academic resources from NYU. US and Non-US citizens are encouraged to apply. Taxes will not be withheld. Naturally, other employment may be coterminous, but Shanati requires a firm commitment to the aforementioned hours.

Please email inquiries to [alexander.jones@nyu.edu](mailto:alexander.jones@nyu.edu). Applications, including cover letter, CV, and two references, are welcome as well.

Interviews will be scheduled on a rolling basis.

**Description of the Shanati project:**

Shanati's goal is to reconstruct the daily ancient Babylonian calendar between 750 BCE – 100 CE by collecting and integrating all available textual evidence (mainly in cuneiform economic and scholarly texts), and coupling that with a calibrated astronomical model for first lunar visibility. There are four major areas of research. One is providing evidence for the length of months, in particular those with a 30th day. Two is providing evidence for the addition of extra, intercalary months in the calendar. Three is providing evidence for the sequence of regnal years and potential regnal overlaps, particularly at times of chronological uncertainty, often due to political and social unrest. Four is investigating the ancient Babylonian methods, practicalities, and theories of making these calendrical decisions.

The output timeline will be aligned with the proleptic Julian Calendar, as well as other ancient calendars, to allow for conversions of any date back to 750 BCE.

Shanati will present these results in a book length print publication, as well as in a state-of-the-art website that will include an embeddable widget, API, simple date conversion interface, advanced custom search, and automated data input portal. The API and embeddable widget will allow for the use of Shanati's results by other websites.

The search interfaces will allow for quick date conversions and for in depth studies that show the full range of evidence supporting any specific date. The portal for further input of data will allow for more attested dates to be added in the future, as more texts are discovered, read, and databased, in a fashion that will update the integration of all the data anew to create the most accurate version of the daily chronology.

Shanati is proud to be funded by the National Endowment for the Humanities with a Digital Humanities Advancement Grant for two years, with Alexander Jones, Director of New York University's Institute for the Study of the Ancient World, as its Principal Investigator, and David Danzig, Researcher at ISAW and the project's creator, as its Lead Researcher. See [shanati.org](http://shanati.org) for more information.

---

## *INTERNET SITES*

### **ROMAN ROAD CONSTRUCTION**

Please visit the site: <https://www.videoman.gr/191792>

---



## ***ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS***

### **ARCHBULG 2022/2 + SUPPLEMENT 3 OPEN ACCESS, ISSUE 26, 2022/2 CONTENTS**

#### ARTICLES

Slavova, M.: Lead Mirror with Greek Inscriptions from the Collection of the Regional Museum of History – Silistra .....1

Plemić, B. / Vasiljević, Lj.: Votive Reliefs from Nozrina near Aleksinac (Thracian Influences in the Cult Practice of Upper Moesia) .....9

Ljubičev, M. / Filatov, D. / Schultze, E.: Rekonstruktion von Drehmühlen der Sântana de Mureș – Černjachov-Kultur nach Materialien aus der Siedlung Vojtenki (Ostukraine) ..21

Traykova, L. / Zlateva, B. / Lesigyarski, D. / Mihaylova, V. / Vagalinski, L. / Kuleff, I.: Archaeometric Study of Belt Fittings to Late Antiquity in Bulgaria .....39

Markov, N.: A New Attempt at Interpreting the Scene ‘Woman Carried Away by an Eagle’ Represented on Jug # 2 from the Early Medieval Treasure of Nagyszentmiklós .93

Guionova, G.: Daily Material Life in Sofia through Locally Produced Ceramics, 15th-19th Centuries .....117

More info at: [www.archaeologia-bulgarica.com](http://www.archaeologia-bulgarica.com)

#### **The 3<sup>rd</sup> issue of ArchBulg. Supplements**

Stiliyan IVANOV. Typology and Chronology of Red Slip Ware from the Production Complexes between the Danube and the Balkan Mountain Range(2nd – 3rd c. AD). 2022, pp. 224

is freely available at: <https://www.archaeologia-bulgarica.com/en/wp-content/uploads/2022/08/Ivanov%20Suppl%203%20inner%20book%20site.pdf>

Regards,

Lyudmil Vagalinski  
editor

**RAW MATERIAL CHOICES AND  
TECHNICAL PRACTICES AS INDICES OF  
CULTURAL CHANGE: CHARACTERIZING  
OBSIDIAN CONSUMPTION AT  
'MYCENAEAN' QUARTIER NU, MALIA  
(CRETE), BY TRISTAN CARTER AND  
VASSILIS KILIKOGLU**

Published: August 23, 2022

**Abstract**

This paper takes a practice-based approach to the study of cultural identity, focusing on how raw material and technical choices involved in the production of quotidian tools served to both reproduce, and reflect a social group's very way of being. We then consider the (dis)continuity of obsidian blade-making traditions from Middle–Late Bronze Age Malia (north-central Crete), i.e., before and after a period of island-wide destructions, and appearance of foreign elements believed to reflect the arrival of a population from the Greek mainland (Mycenaeans).

Methodologically this involves an integrated, 'thick description' obsidian characterisation study to detail long-term cultural traditions, including the use of Neutron Activation Analysis (NAA) to source the raw materials of 36 artifacts. The results show a significant degree of continuity in the community's lithic traditions, suggesting that many of the innovative features at Malia can be interpreted in terms of local factions appropriating new and foreign means of social distinction, rather than wholesale changes in community composition.

**Please visit the site:**

**<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0273093> is posted  
this downloadable article: [See also <https://www.heritagedaily.com/2022/08/study-challenges-views-on-what-drove-major-changes-in-ancient-greek-society-on-crete/144529>]**

---

# **THIN SECTION PETROGRAPHY, GEOCHEMISTRY AND SCANNING ELECTRON MICROSCOPY OF ARCHAEOLOGICAL CERAMICS, BY PATRICK SEAN QUINN**

Thin section petrography, geochemistry, scanning electron microscopy and X-ray diffraction are key scientific methods used to investigate the raw materials, origins and production technology of archaeological pottery, ceramic building materials, ancient refractories and plaster. Using over 400 colour figures of a diverse range of artefact types and archaeological periods from 50 countries worldwide, this book outlines the mineralogical, chemical and microstructural composition of ancient ceramics and provides comprehensive guidelines for their scientific study within archaeology. The core of the book is dedicated to the versatile approach of ceramic petrography. This is complimented by a detailed account of the principles of bulk instrumental geochemistry, as well as the SEM microanalysis and XRD characterisation of ceramics. The book is intended as a reference manual for research as well as a course text for specialist training on scientific ceramic analysis.

## **Table Of Contents:**

### Chapter 1: Introduction to Archaeological Ceramics & Compositional Analysis

Archaeological Ceramics  
Ceramic Compositional Analysis  
Introduction to Thin Section Petrography  
Further Reading

### Chapter 2: Sampling, Preparation & Analysis of Ceramic Thin Sections

Introduction  
Sampling  
Thin Section Preparation  
Analytical Equipment  
Other Resources  
Curation & Access to Thin Sections  
Further Reading

### Chapter 3: Composition of Archaeological Ceramics in Thin Section

Introduction  
The Clay Matrix  
Particulate Inclusions  
Voids  
Further Reading

### Chapter 4: Classification & Characterisation of Archaeological Ceramics in Thin Section

Introduction  
Visual Classification & Description

Quantitative Characterisation & Statistical Grouping  
Macroscopic Fabric Analysis  
Further Reading

Chapter 5: Petrographic Provenance Determination  
Introduction  
Geological Characterisation of Ceramic Raw Materials  
Provenance Resolution  
Geological Literature & Fieldwork  
Quantitative Provenance Determination  
Micropalaeontology  
Interpreting Provenance Data  
Further Reading

Chapter 6: Reconstructing Ancient Ceramic Technology in Thin Section  
Introduction  
Raw Material Selection & Procurement  
Raw Material Processing & Paste Preparation  
Forming Methods  
Finishing  
Drying  
Firing  
Ceramic Use & Function  
Post-Depositional Alteration of Archaeological Ceramics  
Further Reading

Chapter 7: Other Ceramic Materials in Thin Section  
Introduction  
Architectural Ceramics  
Unfired Clay Structures  
Refractory Ceramics  
Other Ceramic Objects  
Petrography of Cementitious Materials  
Stoneware, Fritware, Porcelain & Faience  
Further Reading

Chapter 8: Instrumental Geochemistry of Archaeological Ceramics  
Introduction  
The Chemical Composition of Ceramics  
Equipment & Preparation  
Quality Control  
Descriptive Statistics  
Choice of Elements  
Normalisation, Standardisation & Transformation  
Detecting Geochemical Patterning  
Data Presentation  
Reconciling Geochemical & Petrographic Data  
Geochemical Provenance Interpretation  
Geochemistry & Ceramic Technology

Further Reading

Chapter 9: Scanning Electron Microscopy & X-Ray Diffraction of Archaeological Ceramics

Introduction

Scanning Electron Microscopy

SEM Geochemical Characterisation

SEM Mineralogical Characterisation

SEM versus Thin Section Petrography & Bulk Geochemistry

X-Ray Diffraction Analysis of Ceramics

Further Reading

It is published by Archaeopress Publishing (UK). It is available as a paperback (ISBN-13 9781803272702; ISBN-10 1803272708 US\$49.00) and as an EPUB eBook (ISBN-13 9781803273655; ISBN-10 1803273658 US\$39.99). The publication is distributed in North America by ISD: [www.isdistribution.com/BookDetail.aspx?aId=161540](http://www.isdistribution.com/BookDetail.aspx?aId=161540)

\*\*\*\*\*

Margaret Geiss-Mooney  
Costume/Textile Conservator  
[meg@textileconservator.com](mailto:meg@textileconservator.com)  
(707) 763-8694  
Springfield, OR

\*\*\*\*\*



## ***EΙΔΗΣΕΙΣ - NEWS RELEASE***

# **CONSERVING BEIRUT'S SHATTERED GLASS, BY PHILIP WOODS**

On 4 August 2020, a colossal explosion rocked the city of Beirut, levelling surrounding buildings and damaging others up to 10km away.

The Archaeological Museum at the American University of Beirut (AUB) was one of the many cultural institutions affected. A case displaying 74 glass vessels was smashed against the floor, mixing thousands of shards of ancient glass with fragments from the glass case and surrounding windows.

The British Museum collaborated with the AUB to restore eight of these vessels, which you can see on free display from 25 August to 23 October. Find out more about the project and the vessels' history here.

Here's how the teams from this collaborative partnership restored the vessels over three months...

### **Stage one – sorting the pieces**

Assessing the damage after the removal of the showcase. Photo © The Archaeological Museum at the American University of Beirut, Lebanon.

After the blast, Conservator Claire Cuyaubère and the rest of the AUB museum team documented the broken fragments in situ using an archaeological grid system, which preserved connections between shards as well as their location on the gallery floor. At the same time, the team started to link fragments and stabilise the deteriorated glass surfaces by using a conservation material called Paraloid B72. In the form of small acrylic beads, Paraloid B72 can be dissolved in acetone or alcohol to create a solution which is applied to the fragile surfaces to strengthen them. This initial recovery process was vital as it enabled us to understand how many of these vessels were 'reconstructable' and could become part of Shattered glass of Beirut.

**Stage two** – the vessels arrive in London From the shards, Claire identified eight vessels – ranging from the first to the ninth century – that were able to be reconstructed and could travel to London safely. Once the vessels arrived in London, Claire joined the British Museum team as the Project Conservator and laid out the fragments in the Weston Archaeology Room in the World Conservation and Exhibition Centre (WCEC). Somewhat hidden behind the Museum, the WCEC provides state-of-the-art laboratories and studios for conservation and scientific research and world-class collection stores. We agreed to divide the vessels into three tiers in relation to the number of fragments they were shattered into and the difficulty of reconstruction. Tier 1 objects were the smallest in size and easiest to reconstruct. Tier 2 and tier 3 objects were more complicated and had some decoration.

### **Stage three – beginning the restoration**

Starting to dry reconstruct one of the vessels using Scotch tape.

Claire started with the Tier 1 objects. Before each reconstruction, Claire, who was already very familiar with the vessels, carried out additional puzzle work to make sure that she did not miss out any fragments for each individual vessel. This was a painstaking process.

It was also important to clean the edges and surfaces with a 50/50 alcohol and deionised water solution to remove all the dirt, grease and previously applied conservation adhesives before the fragments could be dry reconstructed, first with Scotch tape. Dry reconstruction helps us see how well the fragments join together, as well as enabling us to gauge the number of missing fragments. However, we could only tape the fragments when the surfaces didn't contain any archaeological deposits or layers of deteriorated 'iridescence' (where the surface of the glass has a rainbow-like effect).

### **Applying conservation adhesive to a fragment.**

At the final stage, the fragments were adhered with a conservation adhesive. This part is particularly challenging. When glass breaks, original shapes and internal tensions that occur during manufacturing become severely affected. This means that when conservators reconstruct glass objects, internal tensions change, and the fragments may resist joining each other as they did in its original form. This is called 'springing'. The conservator needs to be extremely focused to achieve the best joins against all the stresses which glass fragments may present. Once this challenge is completed and the conservator is happy, then the objects are left for the adhesive to fully set before they can be handled again.

### **Final stage – resin fills**

The final stage of conservation was to create resin fills, new pieces that will support some of the missing areas on each vessel for the future protection of the objects. This work involved evaluation and discussions about using individual resins and how to prepare them accordingly for the different areas to be filled. We decided to use Paraloid B72, a commonly used acrylic resin in conservation, both as an adhesive and for the fill material. We traced the shapes of areas to be filled onto plastic Melinex® sheets, then transferred these shapes onto specially prepared resin sheets before cutting them out.

This method helped us create fills which would perfectly fit into the gaps. Finally, the fills were very lightly tinted using acrylic and watercolour paints to make it possible to see the fill rather than hide the repair. Since Paraloid B72 resin dissolves and is activated (becomes sticky) in Acetone, the fills were attached onto the missing areas by gently softening the edges of fills with Acetone.

### **New discoveries**

As the conservation work on these eight vessels continued, scientific analysis was carried out on individual glass fragments, by colleagues from the Scientific Research Department at the British Museum and University College of London's Institute of Archaeology, providing significant information about the provenance of glass production, the nature of glass materials and some interesting manufacturing details.

Using non-destructive scanning techniques, so as not to damage the objects or disrupt the conservation work, the team determined that the vessels were made at sites along the eastern Mediterranean coast, and that some vessels showed signs of recycling in their production, with craftspeople possibly using older glass to make new objects.

**Four of the eight vessels after conservation.**

The conservation part of the project was completed on 8 July with eight glass vessels returning to life after the devastation they had been through. To date, 26 glass vessels have been conserved in total (18 at the AUB Museum and eight at the British Museum), leaving 46 glass objects to be conserved in the near future. This ongoing project gives us great courage that, even in the wake of such destruction, there is hope... there is always hope.

You can see the restored vessels in The Asahi Shimbun Displays Shattered glass of Beirut in Room 3 from 25 August to 23 October.

<https://www.britishmuseum.org/exhibitions/shattered-glass-beirut>

Please visit the site: <https://blog.britishmuseum.org/conserving-beirut-shattered-glass/> [Go there for pix and format]



## **LUXURY DIGS: SPRAWLING 1,200-YEAR- OLD MANSION FOUND IN ISRAEL'S NEGEV DESERT**

Between two mosques in Rahat, archaeologists uncover an opulent home with a finished basement that likely belonged to a wealthy landowner in the early Islamic Period

Luxury can be found in unexpected places. Archaeologists announced Tuesday the discovery of a 1,200-year-old estate in Israel's southern Negev desert, boasting unique underground structures that allowed its owners to overcome the searing summer heat.

In a statement on the discovery, the Israel Antiquities Authority said the sprawling property may have been the residence of a wealthy landowner overseeing farmsteads in the area. It was discovered during excavations conducted ahead of the expansion of the Bedouin city of Rahat, just north of Beersheba.

Archaeologists said the mansion, dated to the early Islamic Period in the 8th or 9th century CE, had four wings and was erected around a main courtyard. Finely colored frescoes adorned the walls and floor in one of the wings, they said, while other rooms featured very large ovens, likely used for cooking.

The most surprising discovery, however, was made under the courtyard – a three-meter-deep cistern dug into the rock that provided the residents with cool water throughout the year, and adjoining vaulted structures.

The archaeologists directing the IAA excavation, Oren Shmueli, Elena Kogan-Zehavi and Noé D. Michael, said that the subterranean vaulted structures were used to store foodstuffs, and enabled the residents to move around freely underground without having to emerge into the punishing sun.

“The luxurious estate and the unique impressive underground vaults are evidence of the owners’ means,” the archaeologists said in the statement.

“Their high status and wealth allowed them to build a luxurious mansion that served as a residence and for entertaining; we can study the construction methods and architectural styles, as well as learn about daily life in the Negev at the beginning of Islamic rule,” they said.

Eli Eskosido, the director of the IAA, touted the archaeologists’ cooperation with the local community in Rahat, among whom he said the discovery was generating “interest and excitement.”

The estate, he added, “was uncovered in an area located between two ancient mosques, perhaps among the earliest ever discovered... The Israel Antiquities Authority and the Authority for the Development and Settlement of the Bedouin are planning together to conserve and exhibit the finds to the general public.”

The IAA said that on Thursday the site would be open to the public for free public tours, including family digging and sieving activities.

**Please visit the site: <https://www.timesofisrael.com/luxury-digs-sprawling-1200-year-old-mansion-found-in-israels-negev-desert/> [Go there for many pix]**

---

---

## **A SOLUTION FOR THE ELGIN MARBLES: ROBOT-CARVED REPLICAS? AMID A GLOBAL RECKONING ON COLONIALISM AND CULTURAL SUPREMACY, PRESSURE IS GROWING ON THE BRITISH MUSEUM TO RETURN THE SCULPTURES TO GREECE, BY KARLA ADAM**

Over the years, many have tried to persuade the British Museum to return the Elgin marbles to Greece. But Roger Michel has something the others didn't: A life-size head of a horse, made from Greek Pentelic marble, that looks remarkably like the one on display in the museum, tiny chips and chisel marks and all, carved by a robot.

At a workshop in Carrara, Italy, a robot sculptor has been putting the finishing touches on a copy of the Horse of Selene, scheduled to go on display in London during the first week of September. The horse is one of the best known of the 2,500-year-old sculptures — also known as the Parthenon Marbles — taken from the Acropolis in Athens in the early 1800s by Thomas Bruce, the seventh earl of Elgin, when he was ambassador to the occupying Ottoman Empire.

Michel thinks his replicas could be the answer to one of history's most notorious cultural controversies. If the British Museum accepts his replicas, he says, they can send the originals to Greece.

“The sculptures we're creating can break this 200-year-old logjam,” said Michel, the director of the Institute for Digital Archaeology, a heritage preservation organization based in Oxford.

The museum hasn't been receptive. It refused his request to scan the marbles — he and a colleague ended up doing it by iPhone and iPad after entering the gallery as normal visitors. Jonathan Williams, deputy director of the museum, threw more cold water on the idea in an interview with the Sunday Times this month. “People come to the British Museum to see the real thing, don't they?” he said.

Still, Michel's offer comes as reassessments of colonialism and cultural supremacy are inspiring the return of human remains and artifacts from museums in Europe and North America to their countries of origin. Britain has been lagging in this reckoning. But public opinion is shifting, and some scholars say the arguments for the status quo, including the fear of museums emptying out, are losing ground.

Some of the greatest momentum has been in the return of artifacts plundered by British soldiers from the historic Kingdom of Benin, in what is now Nigeria, in the late 1800s.

**France returns royal treasures to Benin**

Germany last month agreed that Nigeria could claim ownership of more than 1,000 items from the kingdom that have been held by German museums. In the United States, at least 16 museums have begun repatriating their Benin artifacts, The Washington Post found in May, and the Smithsonian Institution has adopted a new policy that requires its museums to return or share ownership of items that were acquired unethically by modern standards.

London's Horniman Museum said this month it would return 72 artifacts "acquired through force" to Nigeria, including its 12 Benin bronzes.

The universities of Cambridge and Oxford said they would repatriate more than 200 Benin bronzes.

U.S. museums are trying to return hundreds of looted Benin treasures. But that's just a small portion of what's in British hands. The British Museum alone holds more than 900 objects in its collection from Benin. Some scholars and activists have expressed disappointment at the relative lack of movement.

"The British reckoning with colonial violence should not be led from Berlin and Washington, D.C.," said Dan Hicks, a curator at Oxford's Pitt Rivers Museum and author of "The Brutish Museums." "It should be led from London."

As for the Elgin marbles, recent headlines in Britain suggested a deal with Greece might finally be near. But that's probably overselling a "Parthenon partnership" proposal mentioned by Williams.

Williams told the Sunday Times he was eager to "change the temperature of the debate" and believed "there is space for a really dynamic and positive conversation within which new ways of working together can be found."

But if there is a change in tone, there has not yet been a change in policy. The British Museum has not suggested it would give the marbles back to Greece — they're an "absolutely integral part" of the collection, Williams said.

A loan then? That's how some people interpreted Williams's comment:

"There are many wonderful things we'd be delighted to borrow and lend. It is what we do."

But while the museum's board of trustees has said it will "consider any request for any part of the collection to be borrowed and then returned," it requires that the borrowing institution acknowledge the British Museum's ownership.

That's not likely in the case of the Elgin marbles: Their ownership has been the subject of intense dispute from the very beginning. The British government says Elgin had permission to remove them. Others say the permission was limited to pieces found in the rubble — he was not authorized to hack off those that were still attached to the structure. The original permit has been lost to history. And anyhow, Greece says, his deal was with an occupying force that didn't represent the interests or will of the Greek people.

In any case, Elgin had the 5th-century B.C. marbles torn down from the Parthenon and shipped to Britain, where he intended to display them privately in his home. He instead sold them to the British government for \$42,000 to help pay for a costly divorce.

In a visit to Downing Street last year, Greek Prime Minister Kyriakos Mitsotakis renewed Greece's call for the "reunification" of the 80 meters of marble frieze in London with the 50 meters that reside in the Acropolis Museum.

Boris Johnson, the outgoing British prime minister, responded that the matter lay with the British Museum. But that wasn't necessarily true — the museum is bound by laws that prevent some nationally funded museums from returning objects.

"It's an absurd obligation, which American museums don't have. The law needs to change," said Geoffrey Robertson, who was once a part of a team of British lawyers, including Amal Clooney, that advised the Greek government on the marbles. He believes a change in statute will be at the heart of any breakthrough, but said near-perfect replicas offer Britain "an alternative way to effectively display the marbles, to see all that there is to be seen, so the originals can be returned to where they belong and where they have most meaning."

Johnson, as prime minister, has maintained that the marbles should stay in the United Kingdom because they were "legally acquired by Lord Elgin under the appropriate laws of the time."

As a classics scholar at Oxford, he had a different view. In a recently unearthed 1986 article, Johnson wrote that "the Elgin marbles should leave this northern whisky-drinking guilt-culture, and be displayed where they belong: in a country of bright sunshine and the landscape of Achilles, 'the shadowy mountains and the echoing sea.'"

That view today is supported by the British public. Fifty-nine percent of Brits think the marbles belong in Greece, according to a survey by YouGov in November. Eighteen percent said they belonged in Britain.

The Times of London for decades supported keeping the marbles in Britain. But in a January editorial, the newspaper wrote that they should be given back: "times and circumstances change."

Michel says his robot-carved replicas offer one solution.

In other cases, the British Museum has displayed copies of artifacts.

It houses a full-scale reconstruction of the wood and bronze gates of the palace of Shalmaneser III. It contains replicas of a Japanese teahouse and a Korean scholars' study. It has a copy of a helmet from Anglo-Saxon England and plaster casts of ancient Mayan hieroglyphs. It even helped make copies of its copies of a Mayan stairway to install at the original site at Palenque in Mexico.

As with the Elgin marble copies, that project involved robotic cutting tools carving into rock based on a digital 3D model. "Is digital innovation the future for bringing historic events and places back to life?" the British Museum asks rhetorically in the promotional materials.

In a statement to The Washington Post, the British Museum said it “regularly [receives] requests to scan the collection from a wide range of private organisations — such as the IDA — alongside academics and institutions who wish to study the collection, and it is not possible to routinely accommodate all of these.” It said it had accommodated visits from the Acropolis Museum for 3D scanning in 2013 and 2017.

The Institute for Digital Archaeology replicas will cost about \$180,000 to make, Michel said. An initial copy of the Horse of Selene was carved by a robot running nonstop for four days, humming away in a white, airy workshop, its outstretched arm and diamond-coated tip milling local Italian marble. A second copy of the horse will be carved from stone found in the quarries in Greece that were used to make the Acropolis. That marble was obtained “in consultation with Greek authorities,” Michel said.

Giacomo Massari, founder of Robotor, the technical partner on the project, said the 3D modeling allows their robot to create replicas with minute precision — and of much higher quality than plaster copies made by molds.

“You can recognize every scratch,” he said. “You can see the flaws of the stone and you can see the challenges our colleagues from 2,000 years ago were facing. It’s like going back in time — you can feel the struggles of the artist,” he said.

The highly detailed copies will go on display in a space close to the British Museum in September.

Michel hopes that sharing them with the public will, at the very least, put pressure on the museum to shift its position.

“People are tactile creatures, and big stone monuments get people’s attention,” he said. “When you plop them down, people take notice.”

**Please visit the site: <https://www.washingtonpost.com/world/2022/08/22/elgin-marbles-british-museum-greece/> [Go there for pix]**

## **THE MYSTERY ANCIENT TOYS PUZZLING ARCHAEOLOGISTS, BY AMANDA RUGGERI**

Over the two decades that archaeologist Gus Van Beek excavated Tell Jemmeh, an Assyrian settlement inhabited from around 3,800 to 2,200 years ago, he recovered so many objects, it took the Smithsonian 40 years to catalogue them all. There were coins. Scarabs. Amulets. And an amount of pottery so vast, some of it later would have to be discarded.

But for Van Beek, the site – in what is now modern-day south-west Israel – yielded a discovery that was "among the more enigmatic objects recovered": 17 small, rounded discs – some made of chalk, some of stone, but most upcycled from potsherds – with two deliberate holes in the centre.

Van Beek wasn't the first archaeologist to discover objects like these. Nor was he the last. They've been found at sites across Japan, Egypt, India, and the Americas, among others. Three were found in New York City at the site of a British army camp during the American War of Independence, one fashioned from a coin. Others found elsewhere date back 4,000 years.

Some archaeologists believed they were buttons. For others, they were loom weights, perforated pottery, or simply "miscellaneous objects". But they reminded Van Beek of something else. "I remembered playing in my early years with a similar object," he remarked. Thread string through the holes, then stretch and relax the string, and the discs spin. He called the objects what they were known as when he was a child – "buzzes" – and went so far as to experiment with creating one himself.

While a handful of earlier scholars also suspected these were toys, others were sceptical. Relying on one's own childhood memories, and projecting our own, modern experience onto a distant society, seemed unacademic at best.

The mystery of the ancient buzzes is just one of many archaeological puzzles related to children's play, and one that highlights many of the pitfalls of studying it. We know that children played. We know they often played with objects. But other questions, such as which objects, and in what way, have remained stubbornly difficult to pinpoint. So difficult, in fact, that they've inspired archaeology's version of a "dad joke": an archaeologist finds a small object. "Hey, what's this?" he asks. "I dunno," says another. "Must be a toy... or a religious object!"

But understanding how children played is important, not least of all because it gets to the heart of a decades-old debate: what childhood really meant to past generations – if it meant anything at all. In the 1960s, the amateur French historian Philippe Ariès promulgated the theory that for most of history, with child mortality too high for parents to invest much in the way of sentiment or resources in their offspring, children were treated as mini-adults. (Read more about whether we really live longer than our ancestors). That extended to play. After the age of infancy, Ariès wrote, children no longer had toys and games specifically made for them. Instead, they played with the same objects as adults.

While academics have dismantled much of Ariès's theory, many of his beliefs persist. But archaeologists, particularly those who study childhood, are pushing back. And one of the biggest tenets of their argument has to do with their findings around children's play.

"It has been said too often that there was no feeling for childhood – that childhood was a time in life that had to be passed as quickly as possible to become an adult, and then you fully 'exist'," says Véronique Dasen, professor in classical archaeology and art history at Switzerland's University of Fribourg, leader of the EU-supported Locus Ludi project on Greco-Roman games and co-editor of a forthcoming volume on ancient play which publishes in September 2022.

"But that's not true. There is something special in children, and this special value is revealed by their fondness for play. And adults recognised that."

One problem is that, historically, childhood has been ignored by academia. "The child's world has been left out of archaeological research," archaeologist Grete Lillehammer wrote in her seminal 1989 work *A Child is Born: The Child's World in an Archaeological Perspective*.

"Few archaeologists have looked into the subject or given it attention, less ever thought of it as the main field of interest."

But that doesn't mean children weren't a valued part of the community – or that there weren't specific activities and objects primarily aimed at children. We even have etymological evidence: the ancient Greek word for "child" means "someone who plays". And some philosophers describe childhood as a specific life stage that centres on playing.

"Both Plato and Aristotle [talk] about the importance of play, about how it's good for children's development," says Maria Sommer, co-author of the book *Care, Socialisation and Play in Ancient Attica*.

"They actually write to the parents, 'You need to let your children play'. And very interestingly, you didn't start at school in Ancient Greece before the age of seven. Until then, you have free play." (Read more about the benefits of starting education later).

But determining exactly how children played 2,000, 5,000 or 25,000 years ago – and with what – requires both intrepid research and some calculated guesswork.

### **Persistent questions**

For one, most playthings likely were made from natural materials like wood or straw, meaning they are unlikely to have survived: think dolls made from reeds, or games using knucklebones. But even in the face of more durable archaeological evidence, challenges remain.

Take one of the most important clues that archaeologists use to determine what an object is and how it's used: context. If a cup is found in a part of a home where there are also plates and spoons, they might hypothesise that it was used for serving or consuming drink. But if the same cup is found in a tomb alongside jewellery and amulets, it might have been made for decorative or ritual purposes.



With toys, context can be even more slippery. Children play everywhere, not just in predefined areas. (Although there may have been the ancient equivalent of child-centred playrooms, too). Just because an item is excavated in a context we associate with adults doesn't mean it wasn't played with. Some toys may have been adult items that were also used by children. Think of giving a toddler pots and pans to bang. If an archaeologist found those items 2,000 years from now, they might identify them as cooking tools, not as items a two-year-old spent countless hours happily banging.

On the other hand, even when it is excavated in a context associated with children, like a child's tomb, that doesn't mean it always was played with: the object could have been ceremonial or religious.

Complicating matters further is that past cultures differed a great deal from our own – so much so that even our question of "was this a toy, or a sacred object?" might be virtually meaningless.

Take dolls. Like buzzes, miniature female figurines have been discovered around the world. Some ancient writers also seem to describe girls playing toys that could correspond to our modern-day dolls. Plutarch, remembering his daughter who died aged two, says she would ask her nurse to give food to her "objects and toys" and would invite the toys to her table.

One particular doll type has been found in Ancient Greek and Roman sites, either in religious sanctuaries or buried in girls' tombs. With articulated limbs and elaborate details, including on-trend hairstyles and gendered adult characteristics like breasts (no baby doll from antiquity ever has been found), most surviving examples were made of terracotta in Greece, and bone or ivory (with one astounding example made of amber) in Rome. In Greece, terracotta dolls were so popular that they were mass produced with moulds. In Rome, the dolls were produced by specialised manufacturing centres for bone and ivory objects.

That doesn't mean, however, that these were the same dolls Plutarch's daughter would have played with, says Dasen, who is planning an exhibition on dolls at Switzerland's Yverdon Museum in 2024.

"We take for granted that it looks the same as a Barbie, so it is a Barbie. But no." Most of the Greek dolls that have been discovered are made of terracotta, too delicate to withstand the rough and tumble of much play. And many of the manufacturing moulds have been found at religious sanctuaries – which points to more of a sacred function.

Instead, most researchers today agree that these types of dolls were used for specific ceremonial functions: dedicated to the sanctuaries of deities protecting girls and women, like Artemis, Demeter and Core, as part of the rite of passage before marriage or during the wedding ceremony, for example. In Ancient Greek, Dasen points out, *korê* means both "doll" and "unmarried girl".

Then again, the same doll might have had dual uses. "We have the tendency to divide sacral and normal. But they didn't back then," Sommer says. "It was all integrated. There was no segregation between those two worlds." Even in contemporary times, some

cultures have similar overlap: anthropologists have noted that children in the Andes often make, and play with, miniature houses, which are later offered to the gods in the shrines.

### **Piecing play together**

So how do archaeologists and historians have any real idea what children played with?

In some cases, there is a literary record. As one woman named Diogenis wrote to her brother 1,700 years ago in Oxyrhynchus, Egypt, "Many greetings to little Theon. Eight toys have been brought for him by the woman you told me to greet and these I have sent you." There are writings about Agesilaus II, the king of Sparta 2,400 years ago, who liked to ride a horse made of sticks with his son, and Octavian Augustus, Rome's first emperor, who played marbles with children.

Then there is iconographic evidence: the illustrations shown on vases, tombstones and reliefs, for example. Sommer shows me one, an Ancient Greek stela depicting a child sitting and playing with a ball. "So that is not even up for discussion, is it, that this ball is actually something they play with."

She pulls up a different image. "Look at this boy – he's playing with a rattle. And we find identical rattles in the archaeological record."

Ancient Greek rattles were so popular, they even had a manufacturing centre on the island of Cyprus.

This underscores another clue, one relied on by Van Beek in his interpretation of buzzes: what children play with today.

One sociocultural anthropologist, for example, found dozens of parallels between toys of children in contemporary Africa and in Greek and Roman antiquity. If we assume that children today are like children 3,000 years ago, the parallels might shed light on some archaeological mysteries, like the terracotta animal miniatures found in children's graves in Ancient Greece and Rome, often interpreted to be symbolic. In North Africa, children make their own miniature toy animals out of clay and play make-believe games with them.

But we must be careful not to overuse this approach, cautions Dasen.

In one study, she references an Ancient Greek object that looks for all the world like a modern-day yo-yo. It appears on vases, being dangled in the air by children. Identical objects have been found in archaeological excavations. But those that have been found are made of fragile terracotta, and they're often decorated with motifs of seduction. Instead of a yo-yo, it could be an *inyx*: a disc that was twirled to try to attract luck in love.

Even rattles have been contested. While they've been found around the world – Siberia, where the 4,000-year-old clay toy is shaped like a bear cub's head; Turkey, where the black and white decoration is similar to the high-contrast colour schemes we use for infants today; ancient Greece, where even bronze rattles have been found in tombs of particularly wealthy infants – some of them have been too big, and made of material too fragile, to have been convincingly used by small children.

"But look at all these broken rattle pieces that no one's paid attention to. They're in houses, they're in streets, they're in places you would find children," says Kristine Garroway, an associate professor who focuses on children in ancient Israel and Mesopotamia at Hebrew Union College in Los Angeles, California.

"So maybe there's a broader context that has been overlooked, simply because children have been overlooked. And maybe it's the grown-ups or an older child that are shaking a rattle to keep the child quiet."

In the past, the only way to hypothesize if an object was created by a child was to gauge how "crudely" it was made, but today we have more scientific methods. While scholars often have interpreted miniature vessels to be votives, for example, at Israel's Tel Nagila site, which dates back 3,500 years, researchers used fingerprint analyses to determine that children made a number of them. If play was (and is) inherently educational – a "means of developing life-skills", as Garroway puts it, and a way to foster "a child's development as he moves into the adult world" – then these vessels were the result of play. (In her discussion of miniature axes, pots and arrowheads that have been found in Danish Bronze and Iron Age sites, Lillehammer similarly concluded that the items were likely both for play and education: small arrowheads found at a Mesolithic child burial in Skateholm, Sweden, for example, could have been used by children for training. More recent research, including of child-sized 1,700-year-old spear-throwing tools found in modern-day Oregon, has reached similar conclusions).

Another way to find out if a child could have made an object is to set up an experiment. Thirty years after Van Beek's own attempt to make a buzz, Garroway had a different take. Perhaps buzzes not only were played with by children, but made by children – a process that was both play, and a way for children to learn important skills around craft production. To test her hypothesis, she recruited 22 children to break pottery, then try to make their own buzzes. The standout, she says, was one child who took the sherd of a flowerpot which already had a drain-hole, jammed a pencil in the hole, and made a spinning top. "He understood the assignment in a different way," Garroway says, laughing. (Indeed, some archaeologists believe that one use of discs that have been found with a single hole, versus the double-holed buzzes, could have been spinning tops).

Although experts are continuing to chip away at the mystery of how past children played, many questions remain. There are puzzles that we may never solve – which may make archaeology's "dad joke" relevant for some years to come.

Still, Garroway points out, this isn't only true of child archaeology.

"As much as we don't know for sure with children, we don't know for sure with adults about how they were using things," she says wryly.

"We make educated guesses, a lot."

\*\*\*\*\*

\* Amanda Ruggeri is a senior journalist for BBC Future. You can find her at @amanda\_ruggeri on Twitter.

\*\*\*\*\*

Please visit the site: <https://www.bbc.com/future/article/20220816-the-worlds-oldest-toys-what-toys-were-used-in-the-past> [Go there for pix]

---

---

## **WHAT ALEXANDER THE GREAT REALLY LOOKED LIKE, BY TASOS KOKKINIDIS**

Dutch photographer and digital artist Bas Uterwijk has been shining a light on what iconic figures from history might have looked like in real life. His latest creation is Alexander the Great, the king of the ancient Greek kingdom of Macedon, who famously conquered most of the known world of his time.

By using various digital manipulation tools, Uterwijk is able to create photorealistic portraits of famous artists, leaders, mummies, philosophical thinkers, and even the models for paintings. Below is his reconstruction of the face of Jesus.

Based in Amsterdam, Uterwijk has a background in computer graphics, 3D animation, and special effects. He uses a well-known image of each subject to transform them into a photographic portrait.

### **Alexander the Great's life**

Alexander III, the “Basileus of Macedon,” the “Hegemon of the Hellenic League,” the “Shahanshah” of Persia, the “Pharaoh” of Egypt, and the “Lord of Asia”—better known as Alexander the Great—was one of the most significant figures in human history.

Born in Pella in modern-day Central Macedonia in northern Greece in 356 B.C., he was the son of Philip II, the King of Macedon and his wife, Olympias. However, Alexander was no royal place-holder. He became renowned at a very early age for both for his military and political capabilities.

Alexander, whose name in Greek (Alexandros) means “defender of men,” knew as the son of a king that his destiny was already written, putting him at the forefront of history.

This was why while he was still a teenager, he began to be tutored by one of Greece's most respected men, the giant of philosophy and science, Aristotle.

Since his education included philosophy, politics, ethics and science, Alexander was clearly not brought up to become just a warrior but a thoughtful leader of men and society.

Fate dictated that following his father's assassination when Alexander was only twenty, he would take into his command not only the Kingdom of Macedon but also the generalship of the Hellenic League of Greece.

Several years prior to that, his father Philip II of Macedon had managed to unite most of Greece's city-states, urging them to address the Persian threat as a united and solid front. Alexander fearlessly took on this enormous responsibility after the death of his father and began the great march of the Hellenes to the East.

By his own admission, Alexander endeavored to conquer all the way to the “ends of the world and the Great Outer Sea.” He and his legions invaded India in the year 326 BC, winning an important victory over the Pauravas at the Battle of the Hydaspes.

However, after years of never-ending war across the Near East, the mighty general finally turned back toward home at the demand of his homesick troops.

Alexander the Great died in Babylon in 323 BC, the city which he planned to establish as his capital, before he could execute a series of planned campaigns which would have begun with an invasion of Arabia.

Please visit the site: <https://greekreporter.com/2022/08/21/alexander-the-great-look-reconstruction/> [Go there for pix]

---

---

## **BROKEN FORTRESS DISCOVERED UNDER 'MEGA-MONUMENT' BURIAL MOUND IN CYPRUS, BY DONAVYN COFFEY**

Archaeologists excavating an enormous ancient burial mound in Cyprus have uncovered an even older structure hidden beneath it: a rampart, or part of a defensive wall, according to a statement from the Department of Antiquities Cyprus.

The large mound, known as the tumulus of Laona, is longer than a football field, or 328 feet long by 196 feet wide (100 by 60 meters)(opens in new tab) and was likely built around the third century B.C., when the successors of Alexander the Great were fighting for control of Cyprus and large swaths of the empire. Researchers have been gradually excavating and digitally documenting the tumulus over the past decade. But in a new finding, archaeologists learned that the tumulus was erected on top of a broken rampart that is even older than the mound, dating to the early fifth century B.C.

Ancient people on Cyprus buried the fortress wall under about 484,000 cubic feet (13,700 cubic meters) of loose soil with sand, silt or clay, known as marl, and red soil, which had been transported from elsewhere on Cyprus for the construction of the tumulus. The Laona fortress was, therefore, well preserved under the tumulus; its northeast corner survives to a height of 20 feet (6 m), making it one of the most significant monuments of the "Age of the Cypriot Kingdoms", according to the University of Cyprus Department of Antiquities(opens in new tab).

With the "unexpected discovery" of the broken rampart under the "lasting mega-monument," it's apparent that "Laona combines two monuments that are so far unique in the archaeology of Cyprus," the Department of Antiquities Cyprus(opens in new tab) wrote in a statement posted Aug. 13 on Facebook.

The tumulus is located 0.6 miles (1 kilometer) northeast of the Sanctuary of Aphrodite, an ancient site dating to the 12th century B.C. "The mound/tumulus was always visible, but the locals considered it a natural hillock," Giorgos Papantoniou, an assistant professor of ancient visual and material culture at Trinity College Dublin, who was not involved in the excavation. "Its geological identification as an artificial mound was confirmed in 2011."

In 2021, the team published a study in the journal *Geoarchaeology*(opens in new tab), describing the tumulus as "an accomplished architectural structure" that was built over time in several stages. "As the height of the structure gradually increased, the tumulus became an imposing physical mark that gave the landscape a new meaning," the researchers wrote in the study.

The newly discovered rampart is Cypro-Classical, and is credited to the royal dynasty that ruled Paphos through the end of the fourth century B.C. The archaeologists report that the wall is functionally similar to and fits the same timeline as the palace and workshop complexes on the citadel of Hadjiabdoulla, which are only 230 feet (70 meters) away from Laona.

The finding is part of a larger project whose "main goal is the identification of the urban structure of the capital centre of the ancient polity of Paphos," Papantoniou told Live Science in an email.

During a recent excavation, the antiquities team exposed the rampart's east side and two ancient staircases. Further analysis revealed that the rampart turned north under the highest point of the mound. "Its wall follows a descending NW course, and it is in an excellent state of preservation," the team said in the Facebook statement.

The rare defensive monument is 16 feet (5 m) wide and made of mold-made mud bricks between two parallel walls of unworked stone.

Currently, the wall is 525 feet (160 m) long; its internal area is at least 18,729 square feet (1,740 square m), the University of Cyprus reported in the statement.

Investigations at the base of the wall suggest that ancient people leveled the ground to start the project. On top of this leveled ground is a thick layer of river pebbles, followed by a layer of red soil containing sherds, or broken pieces of pottery, according to the statement.

However, it's unclear who built the monument.

"The tumulus was constructed with local soils and sediments, but since there are no tumulus builders recorded from ancient Cyprus, the engineers with the required expertise must have been non-Cypriots, maybe Macedonians," Papantoniou said.

Further excavation of parts of the rampart — such as the northern staircase — has been halted for now due to safety concerns. Moving forward, the Laona project will focus on the tumulus. The enormous burial mound's construction would have required a huge and experienced workforce led by expert engineers, the researchers said. Further research at Laona will try to prove that it is a burial mound and attempt to identify who was behind its construction.

Originally published on Live Science.

Please visit the site: <https://www.livescience.com/mega-monument-burial-mound-cyprus> [Go ther for pix]

---



## **THE MESSAGES THAT SURVIVED** **CIVILIZATION'S COLLAPSE,** **BY SOPHIE HARDACH**

The Sumerians, Maya and other ancient cultures created texts that have lasted hundreds and even thousands of years. Here's what they can teach us about crafting an immortal message.

More than 2,000 years ago, in a temple in the city of Borsippa in ancient Mesopotamia, in what is now modern-day Iraq, a student was doing his homework. His name was Nabu-kusurshu, and he was training to be a temple brewer. His duties involved brewing beer for religious offerings, but also, learning to keep administrative records on clay tablets in cuneiform script, and preserving ancient hymns by making copies of worn-out tablets. These daily tasks, and his devotion to beer, writing and knowledge, made him part of an extraordinarily resilient literary legacy.

Cuneiform had already been around for roughly 3,000 years by the time Nabu-kusurshu picked up his reed stylus. It was invented by the Sumerians, who initially used it to record rations of food – and indeed, beer – paid to workers or delivered to temples. Over time, the Sumerian texts became more complex, recording beautiful myths and songs – including one celebrating the goddess of brewing, Ninkasi, and her skilled use of "the fermenting vat, which makes a pleasant sound".

When Sumerian gradually slid out of common use, and was replaced by the more modern Akkadian, scribes cleverly wrote long lists of signs in both languages, essentially creating ancient dictionaries, to make sure the wisdom of the oldest tablets would always be understood.

Nabu-kusurshu's generation, who would have spoken Akkadian or maybe Aramaic in everyday life, was among the last to use the cuneiform script. But he probably assumed that he was just one ordinary young writer in a long line of writers, preserving cuneiform for many more generations, under the benevolent eye of Nabu, the god of writing and "scribe of the universe". He faithfully copied the old tablets, noting down for example that a Sumerian sign pronounced "u", could mean marriage gift, burglar, or buttocks. He wrote on the tablets that he copied them "for his own study", perhaps as practice or scholarship, and placed them in the temple as an offering.

"He's learning how to write, and learning these lists, alongside other things, and then dedicating his work to the god Nabu and the temple," says Jay Crisostomo, a professor of ancient Near Eastern civilisations and languages at the University of Michigan, who has studied Nabu-kusurshu's tablets in depth.

It was these humble lists, quietly written in the shadow of a giant ziggurat – a pyramid-shaped stepped temple tower – that would earn Nabu-kusurshu immortality.

Many of us may daydream about writing a message that can be read in thousands of years' time, be it to share wonderful poetry with future generations, or warn them about the hazards lurking in nuclear waste.

What's easy to forget is that this is not a mere thought experiment. People have successfully crafted immortal messages – or at least, very long-lasting ones – in the past.

Some of them, like Nabu-kusurshu, even left us a key to entire civilisations.

In the 19th Century, scholars were racing to decipher a mysterious language found on cracked, charred tablets dug up from the sand-covered ruins of Mesopotamian temples and palaces: Sumerian, which had been thoroughly lost and forgotten.

What made the challenge particularly tricky is that Sumerian is not related to any other known language. But the scholars had recently deciphered Akkadian, thanks to its link to surviving languages such as Arabic and Hebrew. And they had also found the ancient scribes' Sumerian-Akkadian clay lists, which they could use as a dictionary.

Among them, one set of tablets stood out for its pristine condition and "distinctive fine script": Nabu-kusurshu's tablets. They were found next to some broken pillars and bricks when archeologists opened the long-buried rooms of the temple at Borsippa around 1880.

"A lot of what we know about Sumerian is via this one man, Nabu-kusurshu," says Crisostomo. He believes the young scribe, who would have been in his late teens or early 20s, produced nearly a quarter of all known copies of a bilingual sign list that proved crucial in the decipherment.

To give you an idea of the size of his impact: these lists helped unlock Sumerian records spanning three millennia of history, including the Sumerians' pioneering use of the wheel, and the 60-minute hour.

Altogether, across different languages, there are more than a million cuneiform texts from the ancient Near East – and we can read them thanks to eternal clues left by ordinary scribes like Nabu-kusurshu.

What helped their messages survive, and stay meaningful, over such a long period of time? And how might we use that knowledge to craft our own messages to the future?

This article is part of The Immortality Project, a special series to celebrate BBC Future's 10th birthday this year – and the wider BBC's Centenary – by exploring what it takes to have a legacy that lasts not just decades but millennia. From long-lived sandwiches to venerable knowledge, art and even religions, we'd like to know how some things survive for thousands or even millions of years, and use this insight to look at whether it is possible to leave a mark on the world that extends into the deep future.

Most thoughts and ideas expressed by humans barely survive the present moment. History is strewn with references to those that vanished – not just individual messages, but entire languages, and with them, the memories of the societies that spoke them. Who remembers Gutian, a language of the ancient world? Thousands of years ago, someone

gave a Gutian translator a payment of beer, according to a Sumerian clay receipt. And that's pretty much all we know about Gutian. Whatever the Gutian people felt, whatever they wished to tell the world, is lost.

All that remains of them are some rather unflattering descriptions by the Sumerians.

On the other hand, there are messages that outlasted centuries of warfare, invasions, and natural disasters. Even though the Spanish destroyed mountains of Maya books, the script survived in rare bark manuscripts and on stone monuments, extending a lifeline to ancient myths and prophecies.

What's the secret of such extraordinary literary longevity? I put that question to three experts on some of the world's oldest languages and scripts, and also asked them how they would write their own message to the future, based on their insights. All of them mentioned certain material aspects, of course – clay and stone are more durable than paper or digital recording methods. The right climate and environment help with the preservation: cuneiform tablets were in fact often baked and hardened by the fire of burning cities under attack. But the experts' most compelling insights were about the writers themselves.

When talking about writing from the distant past, it can be tempting to portray it as some sort of accidental pile of historical debris.

Nabu-kusurshu's legacy, for example, may seem like a fluke of history: the brewer's tablets that turned out to be a kind of Rosetta Stone. But according to the scholars, it's not all due to luck and coincidence. Instead, there are certain habits, values and decisions that may not exactly guarantee literary immortality – but at least, improve its chances.

Of course, the best way to test these factors would be to run a controlled experiment, where different scripts are exposed to challenges – say, the collapse of civilisation – to see which survives. We don't have anything quite like that in history. But we have something that comes a bit close.

**Please visit the site: <https://www.bbc.com/future/article/20220818-how-to-write-a-message-to-the-future> [Go there for pix]**

---

## **ARCHAEOLOGISTS SAY THEY DISCOVERED ANCIENT GLADIATOR TOMBS IN SOUTHERN TURKEY, BY SARAH E. BOND**

The Roman-era burial ground is located in Anazarbus (modern Anavarza) in the country's southern Adana province.

Archaeologists in Turkey say they have discovered a Roman-era gladiator burial ground in Anazarbus (modern Anavarza) in the country's southern Adana province. If true, this would be one of only a few known gladiator cemeteries across the ancient Mediterranean.

As previously excavated gladiator cemeteries reflect: The men and women who fought professionally in the Roman arena were simultaneously celebrated and made infamous. The rare discovery of a gladiator cemetery also provides the potential for digging further into how servitude, the games, and even infamy functioned not only on the sand of the arena but also within the spaces for the dead in antiquity.

Since 2013, continuous excavations at Anazarbus, located within the ancient Roman province of Cilicia, have disclosed a wealth of archaeological finds. The site goes back to the Hellenistic era, before being occupied and annexed by the Romans. It would continue into the Byzantine and Ottoman periods, until being destroyed by the Mamluks in 1374. The site sits at a pivotal inland crossroads that connected tradespersons and travelers to Syria, Mesopotamia, and the Levant. The large urban area had a stadium, theater, triumphal arch, baths, numerous late antique churches, and a wide Roman road decorated with impressively large columns. The only-recent discovery of the amphitheater by researchers from Çukurova University points to the use of gladiators in the area south of Anazarbus, beyond the city walls.

Lead archaeologist Fatih Gülşen told the Anadolu Agency (AA) that her team discovered the tomb near the amphitheater earlier in the summer.

The archaeologists will continue excavations and expect to uncover human remains which they believe will be gladiators; however, such remains have not been securely unearthed or identified. The proximity of the necropolis to the amphitheater does suggest a possible gladiator burial ground, but secure identification of such a burial complex for the fighters is rare. And yet these important spaces, reserved for the dead, can tell us much about the experiences, diet, occupations, status, and social stigmas experienced in life.

If positively identified as a gladiator cemetery, Anazarbus would be only the second city in Turkey and one of only a handful of known gladiator burial grounds across the Mediterranean. In 1993, Austrian archaeologists working at Ephesus along a road called the Via Sacra found a gladiator necropolis dating to the 2nd and 3rd century CE.

Ancient necropoleis were often placed along roads outside of cities, since Greeks and Romans — prior to the dominance of Christianity — buried their dead outside of urban areas, rather than within the confines of the city walls of the polis.

Relief from Halicarnassus (Bodrum) in modern Turkey of two female gladiators, one named Amazon and the other named Achilia (the female version of Achilles). The relief celebrates the *missio* (honorable release) of two female fighters and is on display now at the British Museum, London, UK (photo Sarah E. Bond/Hyperallergic)

The mass grave at Ephesus disclosed 68 individuals. Of these remains, 66 were male and between the age of 20-30 years old. Two other bodies belonged respectively to a woman named Serapias and a man over the age of 50. Although more rare, women could also fight in the arena.

Epitaphs with inscriptions that depict the various gladiator types allowed archaeologists to positively identify the space as a gladiatorial cemetery. As ancient historian Donald Kyle and others have noted, gladiators in the early Roman empire were predominantly enslaved and underwent intense injuries. The osteological (i.e. skeletal ) evidence at Ephesus revealed head traumas that were both fatal and non-fatal. This supports research that suggests that gladiators had a median lifespan of 27 years, but that only around 20% of fights in the arena within the early Roman imperial period ended in death. Many could end in ties or without a fatality. However, gladiator fatalities are believed to have increased to 50% in the later Roman Empire.

Gladiator cemeteries can tell us a great deal about the lived experience of fighters, most of whom were involuntarily enlisted to athletic unions called *familiae*, and owned as chattel by the emperor and local elites. A study of skeletal evidence from Ephesus indicated there was also extensive medical care for gladiators who were injured.

Moreover, the Ephesus gladiators' diets were not heavy on meat. It seems to have been predominantly barley and beans, along with a plant and bone ash drink used as a “dietary supplement.” Their teeth are also an important source of evidence as they provide a record of the extreme physical stress the Ephesus gladiators endured in their forced occupations.

But Anazarbus and Ephesus are not alone. Other gladiator cemeteries have been discovered at Nîmes in southern France, as well as a possible one near York in England that unearthed 80 burials. The fact that gladiators experienced the legal stigma of *infamia* — from whence we get the English word “infamy” — means that although they had social cachet as athletes, they were often considered legally unprotected as persons and subject to violence without much legal redress. By law, any enslaved gladiators were legally property without the civil rights of Roman citizens. Ancient historian Valerie Hope's long-standing work on the gladiator cemetery at Nîmes underscores their ignoble status as well. The Nîmes cemetery was removed from other civic cemeteries and, similar to the one found at Anazarbus, was just south of the Roman amphitheater.

Gladiator burial grounds often reveal the conflicted status of gladiators in Roman culture. These athletes were at once reviled and celebrated by millions in dozens of amphitheaters across the empire, not just within the Colosseum in Rome. Their epitaphs communicate the rhetoric of military victory and prestige; however, these were not honored soldiers.

They were usually buried poorly, and in a space separate from others. The often enslaved, infamous status of many gladiators was frequently reflected in rather ignominious burials either in roadside pits or in areas removed from more high-status persons.

As new Roman amphitheaters continue to be unearthed in places such as Switzerland and elsewhere in the former Roman Empire, archaeologists will no doubt continue to be on the lookout for adjacent burial areas.

These spaces and the gladiators within hold the promise of telling us more about athletes who, while glorified in film and in the popular myths of ancient Rome, were frequently forced to provide bloodshed and violence for popular entertainment — often before receiving an ignominious burial.

**Please visit the site: <https://www.dailysabah.com/life/history/rare-gladiator-tombs-found-in-ancient-city-in-southern-turkiye> [Go there for pix]**

---

# **ANTIKYTHERA MECHANISM: ANCIENT CELESTIAL CALCULATOR, BY OWEN JARUS**

The device tracked the motions of the sun, moon and five planets.

(opens in new tab) (opens in new tab) (opens in new tab) (opens in new tab) (opens in new tab)

The Antikythera mechanism is an ancient shoebox-sized device that is sometimes called the world's oldest computer for its ability to perform astronomical calculations.

Discovered by sponge divers off the Greek island of Antikythera in 1901, the remains of the mechanism are now preserved in the National Archaeological Museum in Athens. Only 82 fragments, consisting of about one-third of the original mechanism, survive today, researchers wrote in a 2021 study published in the journal *Scientific Reports*(opens in new tab). It was built around 2,200 years ago.

## **WHAT DID THE ANTIKYTHERA MECHANISM DO?**

The mechanism was capable of performing different calculations, and it could help track the motions of the sun, moon and five of the planets; it could even tell when athletic competitions, such as the Olympics, were set to take place, the researchers wrote. "It was a mechanical computer of bronze gears that used ground-breaking technology to make astronomical predictions, by mechanizing astronomical cycles and theories," the team wrote in the journal article.

Since the discovery of the Antikythera mechanism, scholars have been trying to understand the device. And although they have made considerable progress, many questions remain unanswered. For example, researchers still aren't sure who made it. Some scholars have posited that the Greek inventor Archimedes (287 B.C. to 212 B.C.) was the mechanism's creator, but this is uncertain. The inscriptions on the mechanism are written in Greek.

Whoever made the device would have had to know a great deal about astronomy, metallurgy and mechanology, Aristeidis Voulgaris, team leader of the Functional Reconstruction of Antikythera Mechanism (Frame) project, told Live Science in an email. This project aims to reconstruct what the mechanism originally looked like and gain a better understanding of it. They also would have needed "great hand dexterity," he noted.

An engraving illustration of the last hour of Archimedes, the mathematician who died in 212 B.C. or 211 B.C. when the Romans captured Syracuse, Sicily. (Image credit: mikroman6 via Getty Images)

The recovered fragments of the mechanism contained writing and inscriptions, and over the past two decades, scientists have been able to read more of these Greek inscriptions

using high-tech imaging methods, such as 3D X-ray scanning. This has enabled them to learn more about how the mechanism worked.

CT scans "revealed inscriptions describing the motions of the sun, moon and all five planets known in antiquity and how they were displayed at the front as an ancient Greek cosmos," the researchers wrote in the Scientific Reports article. The mechanism used "cycles from Babylonian astronomy, mathematics from Plato's Academy and ancient Greek astronomical theories," the researchers wrote.

The mechanism represents "a level of technology exceeding anything else of the kind for which we have either physical remains or detailed descriptions from antiquity," Alexander Jones, a professor of the history of the exact sciences in antiquity at New York University's Institute for the Study of the Ancient World, wrote in his book "A Portable Cosmos: Revealing the Antikythera Mechanism, Scientific Wonder of the Ancient World(opens in new tab)" (Oxford University Press, 2017).

### **WHAT DID THE ANTIKYTHERA MECHANISM LOOK LIKE?**

The authors of the Scientific Reports article found that someone viewing the front of the mechanism would have seen dials that showed the movements of the moon, sun, lunar nodes (points where the moon's orbit crosses the ecliptic, the path the sun appears to take through the constellations), Mercury, Venus, Mars, Jupiter and Saturn, as well as the Zodiac calendar.

The back of the mechanism had dials showing the Metonic cycle (a 19-year cycle after which the phases of the moon occur on the same days of the year), the Callippic cycle (a period of 76 years, equal to four Metonic cycles), the Olympiad cycle (when the Olympics were held every four years), the Saros cycle (a period of more than 18 years between lunar eclipses) and the exeligmos (a period of more than 54 years, or three Saros cycles).

Between the front and back of the mechanism were a vast array of gears, designed in such a way that all the dials would depict the correct timing of all the cycles.

"Suppose a user of the Antikythera Mechanism wants to check eclipse predictions for a particular month some years ahead. The user winds the mechanism forwards to the desired date, as shown on one of its calendars," Tony Freeth, a researcher with the Antikythera Mechanism Research Project, wrote in a paper published in 2014 in the journal PLOS One(opens in new tab).

### **ANTIKYTHERA MECHANISM SHIPWRECK**

This massive marble head found by the latest excavations at the Antikythera wreck site is thought to represent the Greek demigod Heracles. (Image credit: Nikos Giannoulakis/Hellenistic Ministry of Culture and Sports/Swiss School of Archaeology in Greece)

Though the ship that held the Antikythera mechanism was discovered more than a century ago, the wreck has not been fully excavated. The size of the ship that carried it is unclear and just how widely the artifacts are dispersed is also somewhat uncertain. Its



location and depth make it hard to excavate, according to the Woods Hole Oceanographic Institution (opens in new tab) (WHOI). The site is at an angle on the seafloor around 130 to 165 feet (40 to 50 m) below the surface, meaning it's too deep for scuba divers to excavate for long but too shallow to be investigated by remotely operated vehicles, according to the WHOI.

Despite these difficulties a new program of excavation is being carried out by a team of archaeologists and new artifacts continue to be found, shedding light on what the ship, which likely sank around 65 B.C. was like. Their finds include a bronze arm that was once attached to a statue, a board game, possible remains of an ancient throne, and a marble statue head of Hercules, Live Science previously reported.

Researchers have noted that many of the artifacts were luxury goods intended for the wealthy. So far, the recent excavations have not uncovered any new remains of the mechanism.

In 2016, archaeologists unearthed the ancient skeleton of a male at the shipwreck, Live Science reported at the time. Recently, scientists have been trying to extract DNA to learn more about the man.

Researchers still aren't sure why the mechanism was on the ship in the first place. "This was not an object one would casually subject to the risk of travel," Jones wrote in his book. While the mechanism may not have been a one-of-a-kind device, it would surely have been something of considerable value. One possibility is that a technician was transporting the device to its intended owner, Jones wrote, noting that a storm likely caused the ship to sink, taking the mechanism down with it. Where the ship came from and where it was going to is a subject of ongoing research and debate among scholars.

### **ANTIKYTHERA MECHANISM'S 'START DATE'**

Scholars are still debating the Antikythera mechanism's exact "start date," the earliest date on which all calculations made on the mechanism are based. Research published in March 2022 on the preprint server arXiv (opens in new tab) proposed Dec. 22, 178 B.C. as the mechanism's start date. Researchers noted that on that day, there was a lunar eclipse, followed by the winter solstice, followed by a festival dedicated to the goddess Isis. While Isis was an Egyptian goddess, she was highly regarded in Greece at this time.

However, other (opens in new tab) teams of scholars have (opens in new tab) proposed May 12, 204 B.C. as the most likely start date, noting that on that day, a lunar eclipse would have been visible in Greece, and that this date is closer to the life of Archimedes. It's possible that he or someone who worked in his workshop could have built this device.

### **ADDITIONAL RESOURCES**

Members of the Antikythera Mechanism Research Project (opens in new tab) have published many papers on the mechanism and how it worked.

Excavations at the shipwreck are ongoing and more information can be found on the project website (opens in new tab).

The mechanism is now in the National Archaeological Museum (opens in new tab) in Athens.

## BIBLIOGRAPHY

Freeth, T. et al. (2021) "A Model of the Cosmos in the ancient Greek Antikythera Mechanism" Scientific Reports 5821 <https://doi.org/10.1038/s41598-021-84310-w>(opens in new tab)

Freeth, T. (2014) "Eclipse Prediction on the Ancient Greek Astronomical Calculating Machine Known as the Antikythera Mechanism"  
PlosOne  
<https://doi.org/10.1371/journal.pone.0103275>(opens in new tab)

Jones, A. (2017) "A Portable Cosmos: Revealing the Antikythera Mechanism, Scientific Wonder of the Ancient World" Oxford University Press

Voulgaris, A. et al (2022) "The Initial Calibration Date of the Antikythera Mechanism after the Saros spiral mechanical Apokatastasis"  
arXiv  
<https://arxiv.org/abs/2203.15045>(opens in new tab)

Originally published on Live Science.tor

\*\*\*\*\*

Owen Jarus is a regular contributor to Live Science who writes about archaeology and humans' past. He has also written for The Independent (UK), The Canadian Press (CP) and The Associated Press (AP), among others. Owen has a bachelor of arts degree from the University of Toronto and a journalism degree from Ryerson University.

\*\*\*\*\*

**Please visit the site: <https://www.livescience.com/antikythera-mechanism> [Go there for pix and linx]**



**WHAT IF THE ANCIENT GREEKS AND  
ROMANS ACTUALLY HAD TERRIBLE  
TASTE? ANTIQUITIES REPRODUCED IN  
VIVID COLOR, NOW ON VIEW IN  
'CHROMA' EXHIBITION AT THE MET, MAY  
LOOK GARISH TO MODERN EYES,  
REVIEW BY PHILIP KENNICOTT**

Chroma: Ancient Sculpture in Color

Through March 26

Metropolitan Museum of Art, New York.

[<https://www.metmuseum.org/exhibitions/listings/2022/chroma/visiting-guide>]

Even when you know what to expect, the results are disconcerting: 17 richly painted reproductions of ancient sculpture interspersed among Greek and Roman originals, creating a riot of color amid the more subtle hues of marble and bronze. The colorized works are part of the Metropolitan Museum of Art exhibition “Chroma: Ancient Sculpture in Color,” displaying reconstructions of what ancient sculpture may have looked like, based on scientific analysis of pigment fragments from many surviving antiquities.

Scholars have long known that the ancients painted and gilded their statues and embedded metals, precious stones and other materials to make them seem more lifelike. But the belief that ancient sculpture was monochrome — white as marble or uniformly patinated bronze — remains more durable and persistent than the scholarship.

In its new exhibition, the Met is pushing back against the general resistance, using speculative reconstructions by Vinzenz Brinkmann and his wife, Ulrike Koch-Brinkmann, scholars based in Frankfurt, Germany, who have specialized in the study of what is called polychromy. These include a painted reconstruction of the Met’s sixth-century B.C. marble sphinx finial, in which the wings are red and blue with gilded feathers, the tail dipped in blue and the neck ornamented with a red-and-gold choker.

The Met looks at the body, stripped of its whiteness. The colorized works are made of contemporary materials, including plaster casts, synthetic marble, marble, cast bronze, and 3D-printed polymethyl methacrylate, covered with marble plaster and painted in tempera with pigments based on original formulations. The earliest work rendered into color is a Cycladic figure, with an oversize head connected to an abstracted body, now with a small triangle of cinnabar to create a rictus of red lips, dots on the cheeks and arching eyebrows. Since the early 20th century, Cycladic figures have had iconic power for contemporary artists, as an ancient prefiguration of abstraction. They seemed to capture something primitive or dreamlike, Jungian archetypes and Freudian psychic energies, and inspired new ways to distort and reconfigure the human form.

In the colorized version of the Cycladic figure, these minimal facial details fight against abstraction. You may feel as if it looks like a cartoon. It also leaves the uncanny sense that the figure has waked from a long sleep and is keenly aware that you are observing its first flickering of consciousness.

The exhibition also includes archaic and classical Greek statues, Hellenistic figures, and Roman portraits and bronzes. But no matter the style or the era, it is the eyes that cause the most discomfort.

In the works that seem most lifelike to our sensibility — the classical Greek, Hellenistic and Roman figures — the eyes feel crudely done. Even in the archaic Sphinx finial, they disrupt our sense that this is a stylized figure. The eyes connect the figure more to the world of waxwork displays and animatronic figures, contemporary forms of mimesis that seem too eager to please, too urgent in their efforts to dupe us into believing they are real.

The eyes take on preternatural power when two figures are joined in an ensemble, especially the two pugilists who eye each other with exhaustion in a grouping commonly known as the “Terme Ruler” and “Terme Boxer,” discovered in Rome in 1885. The reconstruction of these bronze figures uses different metal alloys and other materials to suggest bruises, swollen lips, gashes and blood, and patination to make the bronze skin more lifelike. It also uses polished precious stones for the eyes, which now stare with a blazing hatred.

Making a bronze statue of this size, and with this level of detail, is already an astonishing feat, even before you add the extra details of color. But the modern viewer may be split between admiration for the basic bronze figures while feeling that the coloration adds unwanted psychological specificity, making their emotions explicit and bringing a blunt sense of their inner life too much to the surface.

The challenge of this exhibition is our own resistance, and understanding the roots of that resistance. The supposed whiteness of ancient statuary is intertwined with larger ideas of Whiteness in European culture, and the sense that colorizing the statues somehow cheapens them could well be rooted in racialized thinking. The colorized statues also seem “new” in the sense that they have just been pressed or stamped by some modern industrial process, and thus lack the supposed authenticity of genuinely ancient things.

But our resistance isn’t always irrational or rooted in pernicious ideas. Sometimes it is just a matter of baggage. All the colorized statues are interpretations of what the polychrome scholars believe they may have looked like. And small, subjective decisions can bring about unwanted or unexpected ideas in the mind of the viewer.

Colors added to the reconstruction of “Small Herculaneum Woman” make the woman's mantle appear translucent. (Vinzenc Brinkmann and Ulrike Koch-Brinkmann/Liebieghaus Polychromy Research Project, Frankfurt/Original: National Archaeological Museum, Athens) A reconstructed statue of the goddess Artemis. (Vinzenc Brinkmann and Ulrike Koch-Brinkmann/Liebieghaus Polychromy Research Project, Frankfurt/Original: Museo Archeologico Nazionale di Napoli, Naples)

Take, for example, a statue known as the “Small Herculaneum Woman,” a graceful figure whose gesture of wrapping a mantle around her torso evokes an elegant sense of sway and motion. In the colorized version, the mantle is a translucent fabric of light

green through which the pink of her gown is clearly visible. It's a bold interpretation and makes the hard material seem almost miraculously diaphanous. But the particulars of this pink and green, and the seeming flimsiness of the material, are coded cheap to contemporary eyes, more like fabrics meant to be seen onstage than up close on the red carpet.

It's also possible that the ancients were simply wrong about using color, and that these statues improved as the colors faded or abraded away. Certainly, we are under no obligation to view these statues in color, so long as we honestly acknowledge their longer history and original appearance as essential facts. And ideas of authenticity are always tricky. The one thing we can never know is whether our ideas of color have any relation to how color was perceived when these works were new.

Indeed, when the ancients wrote about color, from Homer and Parmenides to Plato and Aristotle, their terminology often seems decidedly foreign. Was the wine-dark sea really the color of a fine Chateauf-neuf-du-Pape, or did that refer to something about luster or sheen or some other visual quality? Nietzsche was convinced that the ancient Greeks couldn't see blue or green and lived in a world of black, white, red and yellow.

It's also possible that the original figures were meant to be shocking, and our own sense of shock is an analogue to how they were perceived thousands of years ago. We are surprised because they seem foreign, and even perhaps a bit vulgar to our sense of taste. The ancient sense of surprise may have been no less vigorous, though different in kind: They were shockingly not of the real world, more real, or surreal, in a way that elevated them above the ordinary palette of existence. In the case of mythical figures or gods and goddesses, that aesthetic makes perfect sense.

So, "Chroma" is unsettling — in all the right ways. It asks us to fundamentally reimagine our sense of the ancient world. That's always an effort worth making. After you've made it, feel free to indulge the old works exactly as you wish

**Please visit the site: <https://www.washingtonpost.com/arts-entertainment/2022/08/11/ancient-sculptures-colored-met/> [Go there for colorful pix]**

## **ARCHAEOLOGISTS FIND ENTREATY TO ST. PETER IN EARLY CHURCH BY SEA OF GALILEE, BY RUTH SCHUSTER**

The mosaic more than 1,500 years old cites the church's donor and a plea for intercession that shores up the case of el-Araj as Bethsaida and the basilica as the Church of the Apostles

An inscription with a plea to St. Peter found at the archaeological site of el-Araj strongly supports the case that this is the lost city of Bethsaida and that the basilica there is the Church of the Apostles, a discovery likely to further buoy Christian tourism at the Sea of Galilee.

The mosaic was filthy, as is the case with inscriptions buried in silt for more than 1,500 years. Cleaning it off in the blistering heat of this summer's excavation season at el-Araj – right by the Ottoman mansion Beit HaBek – was the season's highlight, say archaeologists Prof. Mordechai Aviam and Prof. R. Steven Notley.

El-Araj is on the northern shore of the Sea of Galilee and isn't the only candidate for the biblical village of Bethsaida on which the Roman polis of Julias arose. The New Testament is inconsistent about the abode of Peter and his brother Andrew, but the evidence points to Bethsaida as their home, not the fishing village of Capernaum, many researchers say.

Among the highlights at el-Araj, the archaeologists found Roman-period ruins, homes from the Jewish village – and the ruins of a fifth-century Byzantine basilica.

For years, since discovering an ancient church at el-Araj, the archaeologists had dearly hoped to find a dedicatory inscription, as was typical of Byzantine churches. Now they have.

The inscription starts with “Constantine, the servant of Christ.” This refers to the donor to the church, in keeping with Byzantine tradition of dedicatory mosaics. It isn't a reference to Constantine, the first Holy Roman emperor to embrace Christianity, the archaeologists explain.

Then comes the exciting bit: The inscription goes on to petition the “chief and commander of the heavenly apostles” for intercession, according to Prof. Leah Di Segni of the Hebrew University of Jerusalem and Prof. Jacob Ashkenazi of Kinneret College in the north.

Who is this chief and commander? Simon Peter was the first to declare that Jesus was the messiah (Matthew 16:16), and so was considered chief of the Apostles, according to tradition. His prominence is demonstrated by the construction of St. Peter's Basilica in Rome, which was put up over his grave.

Chief and commander of the heavenly apostles is how the Byzantine Christians referred to Peter and only to him, not to any other apostle, say Aviam, professor at Kinneret College, and Notley, professor at Nyack College in New York and the dig's academic director.

So here we have an inscription, framed with a round medallion made of two lines of black tesserae in the Byzantine style, that all but explicitly mentions St. Peter – in an early church dating to the fifth century in a Roman-Jewish city on the banks of the northern Sea of Galilee.

During the next excavation season in October, the archaeologists are keen to find an inscription to Andrew. Since he's also supposed to have lived in Bethsaida, the church would presumably have been dedicated to them both.

The dedicatory inscription and plea to Peter (the first pope, in Catholic tradition) were part of the mosaic floor in the church's sacristy, which, in Byzantine fashion, was decorated with floral patterns. For more information on the inscription we'll have to wait, but the professors promise that it's coming.

### **How Bethsaida was lost**

Does this close the case that Aviam and Notley have found the biblical city of Bethsaida, as they have argued since 2017, and the Church of the Apostles – a more recent postulation?

“I would say yes on both,” Notley says. “I think this is clear evidence that the site we're excavating is the church referred to by St. Willibald [in the eighth century] as the church built over the house of St. Peter and Andrew.”

It bears clarifying that the archaeologists aren't claiming that the Church of the Apostles really was built on the homes of Peter and Andrew. They're claiming to have found Bethsaida and the Church of the Apostles, and if it was built in the “right” place, we don't know.

At least one reason Bethsaida was lost to posterity is that the Sea of Galilee – widely known as Lake Kinneret in Israel – is an inland lake that rises and falls. In fact, the archaeological site was underwater after heavy rain in 2020.

Bethsaida was a humble fishing village by the lake that, according to the Jewish-Roman historian Josephus Flavius, was transformed by local ruler Herod Philip into a polis, a Roman city. In recent years Aviam and Notley have found evidence of both periods of the settlement's life.

“One of the goals of this dig was to check whether we have at the site a layer from the first century,” Aviam says. And they did.

The snag is that Bethsaida continued to appear in historical records – Christian and Jewish – until the late third century, then it vanished from the record for about 200 years. Research has shown that at about that time, the lake rose. Probably together with other sites around the lake, it was lost to flooding and silting.

There are around 40 centimeters (16 inches) of silt between the Roman layer and the Byzantine layer, thus the Roman city and the Jewish village lie below the silt and the fifth century church above it.

The point is that by the time Christianity took shape and by the time the lake receded, it's possible that the local memory of where Peter and Andrew lived was gone. Come the fifth century, visiting Byzantine dignitaries could have been misled or otherwise erred in pinpointing where the apostles' homes were when they had the basilica to be built at that spot.

The newly found inscription can't speak to the accuracy of the choice of location, but it can lend support to the identification of el-Araj as Bethsaida and the basilica as the Church of the Apostles.

“This discovery is our strongest indicator that the basilica had a special association with St. Peter, and it was likely dedicated to him. Since Byzantine Christian tradition routinely identified Peter and Andrew's home in Bethsaida, it seems likely that the basilica commemorates their home,” Notley says.

The mosaic thus also strengthens the case that this is the church described by the bishop of Eichstätt, Willibald, who in the eighth century made a pilgrimage to the sites where Christians believe that Jesus performed miracles around the Sea of Galilee. The bishop reported that the church was built over the house of Peter and Andrew.

The Hodoeporicon – Willibald's itinerary in the Holy Land – says he walked from Capernaum to Chorazin (Kursi) via the Church of the Apostles in Bethsaida.

“And [from Capernaum] they went to Bethsaida, from which came Peter and Andrew. There is now a church where previously was their house,” the bishop wrote.

Supporting the case of the church at el-Araj being that church, the archaeologists point out that there are no other ruined Byzantine churches on the shores of the Sea of Galilee in this area, which is now part of a nature reserve.

The inscription also supports Notley's argument that Peter lived in Bethsaida, not Capernaum. In fact, 1,700 years of Christian tradition always placed Peter's home in Bethsaida, he notes.

But in 1921 a theory raised by one Father Gaudence Orfali suggests Capernaum instead. There is indeed a Byzantine edifice at Capernaum too (not only at el-Araj) – an octagonal church that isn't actually a basilica and therefore can't have been the Church of the Apostles, Notley and Aviam contend.

So the inscription is another nail in the Orfali theory's coffin.

The excavation is being assisted by the Israel Nature and Parks Authority. “The inscription sheds light on the identification of the site with Roman and Byzantine Bethsaida, a place cursed by Jesus because the locals didn't accept his message,” says Dr. Dror Ben-Yosef, head of heritage in the authority's northern district, adding that inscription will be of great interest to Christian tourism.



“The dedicatory inscription with the entreaty for prayer by Simon Peter is very important for identifying the Apostle’s association with the Byzantine basilica. It confirms the testimony of the eighth century Bishop Willibald, who visited the church, that Christianity in the Byzantine period commemorated the house of St. Peter at Bethsaida and not at Capernaum,” Notley says.

“In addition, the persistent remembrance of the location of Peter’s home, in light of the recent archaeological evidence for a surrounding earlier Roman period settlement of at least 40 or 50 dunams [12 acres], adds weight to our suggestion that the site of el-Araj/Beit HaBek should be considered the leading candidate for New Testament Bethsaida.”

**Please visit the site: <https://www.haaretz.com/archaeology/2022-08-10/ty-article-magazine/archaeologists-find-entreaty-to-st-peter-in-early-church-by-sea-of-galilee/00000182-8762-d8ab-a3b3-e77f7f870000>**

---

## **TURKEY'S UNDERGROUND CITY OF 20,000 PEOPLE, BY GEENA TRUMAN**

More than 85m beneath the famous fairy chimneys of Cappadocia lies a massive subterranean city that was in near-constant use for thousands of years.

Violent gusts whipped loose soil into the air as I hiked through Cappadocia's Love Valley. Pink- and yellow-hued hillsides coloured the rolling landscape scarred with deep red canyons, and chimneystack rock formations loomed in the distance. It was arid, hot, windy and devastatingly beautiful. Millennia ago, this volatile, volcanic environment naturally sculpted the spires surrounding me into their conical, mushroom-capped shapes, which now draw millions of visitors to hike or hot-air balloon in the central Turkish region.

But beneath Cappadocia's crumbling surface, a marvel of equally gargantuan proportions lay hidden away for centuries; a subterranean city that could conceal the whereabouts of up to 20,000 inhabitants for months at a time.

The ancient city of Elengubu, known today as Derinkuyu, burrows more than 85m below the Earth's surface, encompassing 18 levels of tunnels.

The largest excavated underground city in the world, it was in near-constant use for thousands of years, changing hands from the Phrygians to the Persians to the Christians of the Byzantine Era. It was finally abandoned in the 1920s by the Cappadocian Greeks when they faced defeat during the Greco-Turkish war and fled abruptly en masse to Greece. Not only do its cave-like rooms stretch on for hundreds of miles, but it's thought the more than 200 small, separate underground cities that have also been discovered in the region may be connected to these tunnels, creating a massive subterranean network.

According to my guide, Suleman, Derinkuyu was only "rediscovered" in 1963 by an anonymous local who kept losing his chickens. While he was renovating his home, the poultry would disappear into a small crevasse created during the remodel, never to be seen again. Upon closer investigation and some digging, the Turk unearthed a dark passageway.

It was the first of more than 600 entrances found within private homes leading to the subterrestrial city of Derinkuyu.

Excavation began immediately, revealing a tangled network of underground dwellings, dry food storage, cattle stables, schools, wineries and even a chapel. It was an entire civilisation tucked safely underground. The cave city was soon spelunked by thousands of Türkiye's least claustrophobic tourists and, in 1985, the region was added to the Unesco World Heritage list.

The city's exact date of construction remains contested, but Anabasis, written by Xenophon of Athens circa 370 BCE, is the oldest written work that seems to reference Derinkuyu. In the book, he mentions Anatolian people, in or near the region of

Cappadocia, living underground in excavated homes rather than the more popular cliffside cave-dwellings that are well known in the area.

According to Andrea DeGiorgi, associate professor of classical studies at Florida State University, Cappadocia is uniquely suited to this kind of underground construction due to the lack of water in the soil and its malleable, easily mouldable rock. "The geomorphology of the region is conducive to the digging of underground spaces," she said, explaining that the local tufa, or limestone soil, would have been fairly easy to carve with simple tools like shovels and pickaxes. This same pyroclastic material was naturally forged into the fairy-tale chimneys and phallic spires jutting from the earth above ground.

But whom to credit with Derinkuyu's creation remains a partial mystery. The groundwork for the sprawling network of subterranean caves is often attributed to the Hittites, "who may have excavated the first few levels in the rock when they came under attack from the Phrygians around 1200 BCE", according to A Bertini, an expert in Mediterranean cave dwellings, in his essay on regional cave architecture. Adding weight to this hypothesis, Hittite artefacts were found inside Derinkuyu.

However, the bulk of the city was likely built by the Phrygians, highly skilled Iron-age architects who had the means to construct elaborate underground facilities. "The Phrygians were one of Anatolia's most prominent early empires," explained DeGiorgi. "They developed across western Anatolia around the end of the first millennium BCE and had a bent for monumentalising rock formations and creating remarkable rock-cut facades. Though elusive, their kingdom spread to include most of western and central Anatolia, including the area of Derinkuyu."

Originally, Derinkuyu was likely used for the storage of goods, but its primary purpose was as a temporary haven from foreign invaders, with Cappadocia seeing a constant flux of dominant empires throughout the centuries. "The succession of empires and their impact on the landscapes of Anatolia explain the recourse to underground shelters like Derinkuyu," DeGiorgi explained. "It was at the time of the [7th-Century] Islamic raids [on the predominantly Christian Byzantine Empire], however, that these dwellings were used to the fullest."

While the Phrygians, Persians and Seljuks, among others, all inhabited the region and expanded upon the underground city in subsequent centuries, Derinkuyu's population swelled to its peak during the Byzantine Era, with nearly 20,000 residents living underground.

Today, you can experience the harrowing reality of life underground for just 60 Turkish lira (£2.80). As I descended into the musty, narrow tunnels, the walls blackened with soot from centuries of torch lighting, the unfamiliar sensation of claustrophobia began to set in.

However, the ingenuity of the various empires that expanded upon Derinkuyu soon became apparent. Intentionally narrow, short hallways forced visitors to navigate the labyrinth of corridors and dwellings while stooped over and single file – obviously an inopportune position for intruders. Dimly lit by lamplight, half-ton circular boulders blocked doors between each of the 18 levels and were only moveable from the inside.

Small, perfectly round holes in the centre of these hefty doors would have allowed residents to spear invaders while maintaining a secure perimeter.

"Life underground was probably very difficult," my guide Suleman added. "The residents relieved themselves in sealed clay jars, lived by torchlight and disposed of dead bodies in [designated] areas."

Each level of the city was carefully engineered for specific uses.

Livestock was kept in stables nearest to the surface to reduce the smell and toxic gases produced by cattle, as well as provide a warm layer of living insulation for the cold months. The inner layers of the city contained dwellings, cellars, schools and meeting spaces.

Identifiable by its unique barrel-vaulted ceilings, a traditional Byzantine missionary school, complete with adjacent rooms for study, is located on the second floor. According to DeGiorgi, "the evidence for winemaking is grounded in the presence of cellars, vats for pressing and amphoras [tall, two-handled jars with a narrow neck]."

These specialised rooms indicate that inhabitants of Derinkuyu were prepared to spend months beneath the surface.

But most impressive is a complex ventilation system and protected well that would have supplied the entire city with fresh air and clean water. In fact, it's thought that the early construction of Derinkuyu centred around these two essential elements. More than 50 ventilation shafts, which allowed for natural airflow between the city's many dwellings and hallways, were distributed throughout the city to avoid a potentially fatal attack on their air supply. The well was dug more than 55m deep and could be easily cut off from below by the city inhabitants.

While Derinkuyu's construction was indeed ingenious, it's not the only underground city in Cappadocia. At 445 sq km, it's merely the largest of the 200 and counting underground cities beneath the Anatolian Plains. More than 40 of these smaller cities are three or more levels deep beneath the surface. Many are connected to Derinkuyu via carefully dug tunnels, some stretching as long as 9km. All of them are equipped with emergency escape routes in case an immediate return to the surface was necessary. But Cappadocia's subterranean secrets have not yet all been excavated. In 2014, a new and potentially even larger underground city was unearthed beneath the Nevsehir region.

Derinkuyu's living story came to a close in 1923 when the Cappadocian Greeks evacuated. More than 2,000 years after the city's likely creation, Derinkuyu was abandoned for the last time. Its existence was all but forgotten to the modern world until some errant chickens brought the subterranean city back into the light.

**Please visit the site: <https://www.bbc.com/travel/article/20220810-derinkuyu-turkeys-underground-city-of-20000-people> [go there for pix]**

## **POMPEII PHOTOS PROVIDE STUNNING NEW GLIMPSE INTO MIDDLE-CLASS LIFE BEFORE MOUNT VESUVIUS ERUPTED**

A trunk with its lid left open. A wooden dishware closet, its shelves caved in. Three-legged accent tables topped by decorative bowls. These latest discoveries by archaeologists are enriching knowledge about middle-class lives in Pompeii before Mount Vesuvius' furious eruption buried the ancient Roman city in volcanic debris.

Pompeii's archaeological park, one of Italy's top tourist attractions, announced the recent finds on Saturday. Its director, Gabriel Zuchtriegel, said the excavation of rooms in a "domus," or home, first unearthed in 2018 had revealed precious details about the domestic environment of ordinary citizens of the city, which was destroyed in 79 A.D.

In past decades, excavation largely concentrated on sumptuous, elaborately frescoed villas of the Pompeii's upper-class residents.

But archaeology activity in the sprawling site, near modern-day Naples, has increasingly focused on the lives of the middle class as well as of servants and other enslaved people.

In this image provide by the Pompeii Archeological site press office, archeologists work on the site of a new discovery. The latest discoveries in the ancient city of Pompeii are enriching knowledge about the everyday lives of middle-class households. The director of the archaeological site, Gabriel Zuchtriegel, said on Saturday, Aug. 6, 2022, that excavations of rooms in a home first unearthed in 2018, revealed the environment of ordinary citizens of the city, which was flourishing before being destroyed by the volcanic eruption of Mount Vesuvius in 79 A.D. (Parco Archeologico di Pompei via AP)AP

"In the Roman empire, there was an ample chunk of the population that struggled with their social status and for whom 'daily bread,' was anything but a given," Zuchtriegel said. "A vulnerable class during political crises and food shortages, but also ambitious about climbing the social ladder."

The recent finds include furnishings and household objects in the domus, which was dubbed the House of the Larario for an area of a home devoted to domestic spirits known as lares. The home unearthed in 2018 has one in the courtyard.

Zuchtriegel noted that while the courtyard also had an exceptionally well-adorned cistern, "evidently, the (financial) resources weren't enough to decorate the five rooms of the home." One room had unpainted walls and an earthen floor apparently used for storage.

In a bedroom, archeologists found the remains of a bed frame with a trace of fabric from the pillow. The kind of bed is identical to three, cot-like beds unearthed last year in a tiny room in another residence that archaeologists believe doubled as a storeroom and sleeping quarters for a family of enslaved inhabitants of Pompeii.

The bedroom findings announced Saturday also included the remains of a wooden trunk with an open lid. Although the weight of beams and ceiling panels that crashed down in the wake of the volcanic explosion heavily damaged the trunk, among the objects found inside was an oil lamp decorated with a bas relief depicting the ancient Greek deity Zeus being transformed into an eagle. Nearby was a small, three-legged round table, similar to the accent tables in vogue today.

Exposing the storeroom revealed a wooden closet, its backboard still intact but the shelves caved in. Archaeologists believe the closet had at least four panel doors and held cookware and dishes for the nearby kitchen. The excavators found a hinge from the enclosure.

Other objects found in the house include a large fragment of what had been a translucent, rimmed plate in brilliant hues of cobalt blue and emerald, and a well-preserved incense burner, shaped like a cradle

**Please visit the site: <https://oregonlive.com/nation/2022/08/pompeii-photos-provide-stunning-new-glimpse-into-middle-class-life-before-mount-vesuvius-erupted.html>**  
[Go there for pix & caps]

---

## **FIRST ROMAN MILITARY AMPHITHEATER DISCOVERED IN ISRAEL’S ARMAGEDDON, BY MARGARET CRABLE**

The excavation, led by USC Dornsife scholars, yielded clues about the lives of ancient Roman soldiers stationed outside the fabled city in the Province of Judea.

The Roman army built a large base and a military amphitheater just outside the ancient city of Megiddo, better known by its biblical name: Armageddon. (Photo: Courtesy of Jezreel Valley Regional Project.)

In 1902, the archeologist Gottlieb Schumacher began digging around Armageddon.

He was conducting the first survey of the ancient city of Megiddo in northern Israel, better known by the biblical name Armageddon, the Greek translation of the Aramaic “Har Megiddo” (the hill of Megiddo).

The Christian Bible prophesizes that the armies of the world will gather at Armageddon for a last battle at the end of times, and the name has gradually come to denote apocalypse in general. But the famed city is indeed real, and has been home to human civilization almost continuously since the Neolithic period.

Schumacher’s primary interest was the ancient city of Megiddo, but he did do a bit of digging in the surrounding area. He uncovered evidence of occupation by the Roman army and noted a large, circular depression in the earth. An ancient amphitheater, he guessed.

It wasn’t until 2013 that a team of researchers began the first official excavation of the army base that Schumacher hypothesized was in the vicinity. They uncovered both the walls and administrative center of the Roman 6th Legion’s base and hypothesized that the odd depression was a military amphitheater associated with the legion.

In July, scholars from the USC Dornsife College of Letters, Arts and Sciences finally proved this hypothesis to be correct. It’s the first Roman military amphitheater ever uncovered in the Southern Levant, which encompasses Israel, Jordan and Palestine.

### **Into the pit**

Mark Letteney has a forthcoming book on incarceration in the ancient Mediterranean. (Photo: Courtesy of Mark Letteney.)

Excavation of the amphitheater was led by historian and archaeologist Mark Letteney, a postdoctoral fellow at the USC Mellon Humanities in a Digital World Program, headquartered at USC Dornsife.

Letteney, who first worked on the site in 2015, studies the emergence of Christianity in Rome, incarceration in Mediterranean antiquity and military infrastructure in Roman Palestine.

This season was his team's first full excavation of the amphitheater. Their work revealed enough of the structure to confirm the hypothesis that it was built for the local military base, occupied by Legio VI Ferrata (the 6th Ironclad Legion), which protected Rome's holdings in what was then the Province of Judea. The base is currently being excavated by the Legio Project, part of the Jezreel Valley Regional Project that is investigating the many human civilizations that have occupied the area.

Military amphitheaters were generally smaller than the civic amphitheaters designed for gladiator combat or executions (structures made famous again by the 2000 film *Gladiator*). These were used for troop training, marching, speeches and, perhaps most important, fun.

“When soldiers are the occupying force (which is demoralizing), far from home, and don't speak the local language, they don't have a lot of outlets. So, they played games and put on public events for entertainment,” says Letteney.

The site is particularly interesting because of its layered history, says Letteney. Prior to the amphitheater, locals had begun digging clay from the rich soil to create ceramics. When the Romans arrived, they likely also used the clay to make roof tiles, floor tiles and pipes for their sprawling base.

Over time, a large pit formed from excavation, and eventually, Letteney says, the legion decided to take advantage of the depression.

They capped the pit's edges with a stone surface and installed seating and gates for access. The Romans would have commissioned military engineers, similar to the modern Army Corps of Engineers, to erect the structure.

The idea that the Romans first excavated clay from the pit before turning it into an amphitheater still requires some testing. Letteney and his team studied clay from the site and it appears to be identical to the tiles made by the legion, but findings are preliminary. They next need to fire the clay and then look at it under a microscope to draw a firm conclusion.

### **Gold rush**

Assisting Letteney in his work was Krysta Fauria, a first-year religion PhD student focused on early Christianity and the gospels. It was her first time on an archeological site, and she credits Letteney with getting her there.

“One day Mark was talking about how he was going on his dig, and off the cuff he asked me if I wanted to go,” says Fauria. “I was like, ‘I don't have any experience, I don't have any training, I don't see how I would be able to.’ And he said, ‘You're in school, that's the point: You're being trained.’”



Religion PhD student Krysta Fauria uncovered a gold coin dating from 295 AD. (Photo: Courtesy of Krysta Fauria.)

Letteney helped Fauria apply for funding, and she secured a prestigious William G. Dever Fellowship from the American Society for Overseas Research. Once on the site, she quickly made herself useful:

It was Fauria who found a gold coin that has helped the team more accurately date the structures.

After digging some 6 feet below the ground at the excavation site one afternoon, Fauria's spotted something sparkling in the sun.

“All of a sudden, I struck loose some dirt, and this shiny coin appears. Everybody just kind of gathered around; it was a really crazy thing,” says Fauria. The coin, which seems to have lost none of its brilliance over the centuries, dates from 245 AD, during the reign of Emperor Diocletian.

For Fauria, this experience has helped her connect viscerally with her new field of studies, after a former career as a journalist with Associated Press News.

“Being in Israel and Palestine, you realize that it's important for people who study this to go, even though obviously we're separated by a lot of time, to get a feel for the geography and the climate,” says Fauria.

Research on the site will continue next summer, with Letteney back in the trenches. He's hoping to uncover more of the east and west gates of the amphitheater. This will allow them to do more precise dating and get a better sense of the construction style of those Roman engineers from nearly 1,700 years ago.

Please visit the site: <https://dornsife.usc.edu/news/stories/3745/romans-at-armageddon/> [Go there for pix]

---

## **ISRAELI REPLICA OF 2,400-YEAR-OLD SHIP SOLVES ANCIENT MEDITERRANEAN MYSTERY**

For years, researchers wondered how sailors in ancient times sailed westbound in the Mediterranean Sea, contrary to the prevailing wind. A University of Haifa researcher found the answer with the help of both modern and antique hardware Gid'on Lev

The apostle Paul may be the most influential Jew in history. Many people believe that the apostle, rather than Jesus (whom he never actually met) contributed more than anyone else to the development of Christianity as a religion separate from Judaism.

After converting to Christianity sometime between 31 and 36 C.E., Paul sailed throughout the Roman Empire and spread his message. His final journey was from Caesarea to Rome, where he was sent to be tried due to accusations by the high priest Ananias ben Nedebeus. The New Testament book The Acts of the Apostles describes the slow and prolonged journey by sea, in several different ships, to the capital of the empire, which ended prematurely when Paul's ship was shipwrecked off the coast of Malta.

This description comes from one of the few detailed written accounts of sea voyages that remain from that period. "Until recently, we didn't understand why the Alexandrian grain ship, that Paul joined in southern Anatolia, bound for Rome, chose that particular route," says David Gal, a doctoral student in the Department of Maritime Civilizations at the University of Haifa.

The journey from the shores of Caesarea toward Rome was not an easy route. The winds in the Mediterranean are virtually all westerly, and researchers have never understood how sailors in ancient times sailed into the wind with the simple ships at their disposal.

Now Gal is proposing a solution to the riddle.

In order to reach the solution, he used "Big Data" analyses of 750 million sets of weather data. He also embarked on a series of voyages in a replica of a merchant vessel that sank near Kibbutz Ma'agan Mikhael (just north of Caesarea) some 2,400 years ago.

Gal summarized his findings in a study he wrote with Prof. Deborah Cvikel, a researcher of ancient sailing ships from the University of Haifa, and climate researcher Prof. Hadas Saaroni of Tel Aviv University, which was published last month in the Journal of Archaeological Method and Theory.

Drawing on huge quantities of data, this is an exceptional study. The research is ultra-modern, while the journeys in the replica ancient ship turn it into a classical field study.

### **Taking to the waters**

I found the replica ship, Ma'agan Mikhael II, anchored in the Shavit marina in Haifa, where the Kishon meets the Mediterranean. Early one morning, a team of about 10

volunteers, who also participated in building the replica ship, prepared the boat before it set out to sea.

The crew members delicately unfurled the flax sail, which was treated with yellow ochre, flax oil and melted beeswax – traditional methods for protecting the fabric from damp and rot. They attached the heavy sail to the ship's yard, which they raised to the top of the mast with a rope halyard.

There were already major commercial ties in the Mediterranean 3,000 years ago

With just the single sail, the ship's navigational abilities are very limited. It set off from the marina, dwarfed by huge containers for modern merchant ships, with the aid of a tugboat. Once in open waters, the tow line with the tugboat was severed, the yard diverted to an angle of 30 degrees to the southwest wind, and Ma'agan Mikhael II sailed toward Acre at a speed of 3.4 knots (3.9 mph)

There were already major commercial ties in the Mediterranean 3,000 years ago and more, and some historians claim it was these maritime ties that enabled the development of civilizations surrounding the sea. Without the Mediterranean, ancient Greece and Rome would never have developed because there was no other way to transfer the quantities of merchandise required to maintain such large empires.

Overland transport was extremely expensive and even more difficult.

Despite the importance of the maritime ties, very little is known about how sea voyages were carried out. "There are almost no written accounts on the conduct of sailings – maybe because the sailors didn't know how to read and write," Gal points out.

From the 13th century B.C.E. until around 700 C.E., sailors sailed in one-mast ships with a square sail like Ma'agan Mikhael II. These ships had no problem sailing from the Aegean region to the eastern Mediterranean (the Levant), with the help of the westerly winds. But they had very little ability to sail against the wind, so that it was never clear how they made the return journey.

One theory was that the sailors sailed close to the coastline, exploiting the daily breeze cycle, in order to creep northward from the Levant and to continue westward near the coast of southern Turkey.

"Only when we sailed on Ma'agan Mikhael II did we understand the real limitations of the ship and the sailors," Gal says. "We found that in many sections of the coast, the breeze doesn't support this type of movement."

'Over the years there are many fluctuations in temperature or in the amount of rain, but the wind regime remains almost unchanged.'

Gal found a way to solve the mystery while sailing a yacht in the Mediterranean. He noticed that although the average wind direction was westerly, there was also variance in the wind that enables sailors to occasionally take advantage of winds blowing from east to west. "The problem was that we couldn't know whether the variance in the wind would have been enough for sailing a ship all the way from the Levant to the Aegean Sea," he notes.

He also had to check whether it is possible to rely on modern meteorological data to represent the wind regime that prevailed in the Mediterranean some 3,000 years ago.

Gal found a study that combined all the wind listings from the period of the Greek and Roman empires. “They described the winds and their seasonality very precisely, because they were very dependent on them,” he says. Gal also used studies that examined the climatological history of the major pressure systems in the Atlantic Ocean (which then govern the wind regime in the Mediterranean), with the help of plankton residue indicated sea surface temperatures.

An in-depth examination of the two sources indicated that there was almost no difference between the wind regime in the Mediterranean 3,000 years ago and of today.

“Over the years there are many fluctuations in temperature or in the amount of rain, but the wind regime remains almost unchanged,” Gal says. “That’s what makes the present study possible.”

### **Sailing bug**

Gal spent 20 years serving as a pilot in the Israel Air Force, and after his retirement swapped his flying bug for a sailing one. Today he is also the meteorologist supporting the Israel Sailing Association and Olympic sailing team. He gathered wind data of 7,000 points in the Mediterranean region spaced 27 kilometers (nearly 17 miles) from one another, and timed at every hour for 15 years. That’s how he got slightly less than a billion sets of data. “I needed over two months just to download the wind data and data about the wave regime and ocean currents from updated meteorological databases, which use satellite collected wind data,” he recounts.

Based on the meteorological data, Gal – who also has a degree in computer sciences – carried out simulations of voyages in a virtual ship with characteristics similar to the ancient ships, on 224 different routes in the eastern and central basins of the Mediterranean. The sampling represents most of the sailing options in ancient times.

They conducted 5,479 virtual sailings on every sailing route – the equivalent of setting sail every morning on every route for 15 years – for a total of over 1.2 million virtual sailings.

Gal examined the feasibility of completing each of the journeys, taking into account the winds, height of the waves and estimated number of days for the journey. He found that the average sailor had enough opportunities to sail westward in a reasonable manner. “We were able to map the seasonal potential sailing mobility on each possible route, and for example we identified when and why a grain ship would prefer to sail to Rome via southern Anatolia.”

“They didn’t sail counter to the prevailing wind, but waited for days with a favorable wind in the opposite direction,” he declares. “We found there were such days in a large meteorological sampling. Until now, scholars didn’t examine that but used low resolution meteorological averages that erase the variance in the wind.”

Gal adds that it's only in the past 15 years that meteorological data of sufficiently high resolution has existed in order to discover this variance.

Furthermore, Gal used machine learning to examine whether the computer could predict when it was worth going out to sea based on the prevailing conditions on the day of departure.

It was found that the software identified 75 percent of the days when it was possible to set out for a safe journey, as well as 80 percent of the days that did not lead to a safe journey. "The ancient sailors certainly knew better how to decide when to set sail and when not to,"

Gal says.

"We're starting with the assumption that the ancient seafarers were reasonable people," he adds. "In other words, they wanted to stay alive, and didn't want to waste their time on a trip when they would most probably have to return to port. Just as modern-day fishermen know how to read the sky, and to estimate with high probability when the sea will be stormy and when there will be a lull of several days, we assume that the ancient sailors also knew how to read the sky and to identify with high probability when it was worth their while to embark on a journey from east to west."

Prof. Cvikel notes that the study "changes what we thought until now. The sailors felt the sea, smelled the wind, knew when it was possible to sail. That's something that's passed down from grandfather to father to son, and everyone learned from a very early age. That enabled them to sail on the Mediterranean all year round and to maintain commercial ties."

Gal tested his computerized analysis in real time. "Ma'agan Mikhael II has already set sail over 80 times, and on one of the trips went to Cyprus and back," he says. "We have data about its performance in all wind conditions and how various currents affect it, and that enables us to conduct a reliable simulation of sailing. With its help, we acquired insights into the way such a ship is operated; we had a better understanding of how four people can sail from Greece to here and back."

The original ship was discovered in 1985, buried at a depth of about 2 meters (6 feet, 7 inches) in the seabed near Kibbutz Ma'agan Mikhael, which was home to the ship's researcher, Dr. Elisha Linder.

A large part of its hull was preserved, and after digging and preservation activities that lasted 15 years, researchers were able to reassemble it. The preservation of the wood alone took seven years.

The original ship is now located in the Hecht Museum at the University of Haifa.

From the parts of the ship that were preserved, the researchers reconstructed a piece of its hull. In 2014, construction began on a large ship with the same dimensions, with the same materials and using the same construction methods. The work was conducted by a group of volunteers and was led by Prof. Yaacov Kahanov. Sadly, he died in 2016, a few days after the completion of the replica.

Today, Ma'agan Mikhael II is one of only two ships in the world that simulate a Mediterranean merchant sailing vessel from that period (the other is a replica of a ship that is about 100 years younger, which was found in northern Cyprus).

The original ship from Ma'agan Mikhael didn't transport olive oil or wine, but an expensive cargo of 12 and a half tons of slate – stone that wasn't available in the Land of Israel and was apparently meant for construction in the Greek colony of Tel Dor. The local real estate obsession is nothing new, it seems.

The theory is that the ship sank on its maiden voyage, since no remains of snails or marine flora were found on its side.

“It's going back 2,400 years,” says Gal, reflecting about sailing on the replica. And in fact, boarding the deck of the Ma'agan Mikhael II is rather like entering a time capsule. Everything is amazingly simple. There are no electrical outlets, no plastic, no screens. The hundreds of nails that secure the planks were created manually, one at a time, from copper. And the ship sails.

“The elephant in the room in studies of seafaring is that all of the researchers are very divided regarding the capability of the ancient ships,” Gal says. “Some say they were entirely subject to the mercies of the winds, while another school claimed they were able to sail upwind, almost like modern yachts. Until now there were very hypothetical studies, and here we have a seagoing vessel with which we can really test that.”

Next spring, Gal is planning to sail the replica ship with the volunteer crew to Greece. “It will take three to four days to reach western Cyprus, where we'll wait for another window of opportunity, and then another three to four days until Rhodes.”

A previous traveller followed a similar route. According to ancient records, Paul ended up staying in Cyprus for nearly two months.

**Please visit the site: <https://tinyurl.com/edf8ep9a> [Go there for pix]**

## **MEDITERRANEAN COUNTRIES TAKE ON ARCHAEOLOGY PROJECT OFF TUNISIAN COAST , BY RINA BASSIST**

Algeria, Croatia, Egypt, France, Italy, Morocco, Spain and Tunisia are working together on an underwater archaeological expedition, researching the Skerki Bank region off the Sicily and Tunisian coasts.

The Alfred Merlin French research vessel is currently at sea. It is a highly sophisticated boat designed for the French Ministry of Culture and especially for underwater archaeology missions. Its equipment includes underwater civil drones for research. Unveiled on May 2021, its special composite reduces the boat's environmental impact, reduces its greenhouse gas emissions, and limits its underwater vibration and noise propagation.

On Aug. 24, the Alfred Merlin departed from Trapani in Italy to the northern edge of the Skerki Bank on the Italian marine continental shelf. On board are a dozen marine archaeologists from several Mediterranean countries, including Alison Faynot who coordinates this mission on behalf of UNESCO. Algerian Nazim Bensalah, Egyptian Emad Khalil, Moroccan Azzedine Kara and Tunisian Wafa Ben Slimane are some of the other underwater archaeologists onboard.

Two days before sailing, UNESCO Chief Audrey Azoulay tweeted, "An underwater mission coordinated by UNESCO about to depart, in search of archaeological treasures off the Tunisian Italian coast." Her office told Al-Monitor that Azoulay and the ambassadors of the respective Mediterranean basin countries were all very excited over this pioneering project.

Speaking on the phone from the boat, Faynot explained that the mission at hand is unique. It is the first time that eight countries come together to preserve what they consider a common undersea cultural heritage. The Alfred Merlin is expected to stay in the Italian continental shelf zone one more day. Then it will continue to the Tunisian continental shelf not far away for another week of exploration.

"This mission constitutes an important step in a cooperation project that started already in 2018 when eight countries decided to protect together what they believe to be shared underwater cultural heritage in the Mediterranean. All eight are countries that have ratified the 2001 UNESCO convention on protecting underwater cultural heritage. Our mission now at sea is the practical embodiment of this project. Since 2018, we conducted meetings and discussions between underwater archaeology experts, especially in the last two years, including important decision-making. Now, with the boat, we reached the crucial step of underwater exploration," Faynot told Al-Monitor.

The 2001 Convention on the Protection of Underwater Cultural Heritage unites countries committed to protecting, understanding and making this heritage better known to the public. UNESCO's website notes that "the oceans, seas, lakes and rivers hide from view and protect under the surface a priceless heritage, largely unknown and underestimated.

No one can protect what is unknown."

Working to implement these principles is UNESCO's Scientific and Technical Advisory Body (STAB) to the 2001 UNESCO Convention. It provides advice and assistance to the meetings of states parties on technical and scientific issues relating to underwater heritage. STAB has been active in Haiti, Guatemala, Madagascar, Bulgaria and Panama. The current mission is the first time that a whole group of countries join forces for a common underwater project.

"Usually, you have one country exploring an underwater site of a wrecked ship, or perhaps two countries, when a ship of one of them was lost in the other's water. Then you have bilateral cooperation and joint exploration missions. Here, eight Mediterranean countries, all signatories to the convention, decided to work together. This mission brings together underwater archaeologists from Algeria, Croatia, Egypt, France, Italy, Morocco, Spain and Tunisia," said Faynot.

"This area has played an essential role for centuries in the military, commercial, cultural and religious dialogue of the Mediterranean basin. In fact, we know that this region of the Mediterranean was a busy maritime trade route used from the Antiquity era until today, for over three millennia. It was actually one of the busiest in the world.

In ancient times, it was a direct maritime route between Carthage and Rome. Located between the western and eastern basins of the Mediterranean Sea and between the south and the north of this sea, it always served as a contact point between many cultures, which also means that several wars have also played out, including during the first and second world wars."

The busy trade, pirates and wars explain only partially why archaeologists are so interested in this underwater area. "Due to the particular geological features of the Skerki Bank, such as rocky elevations and other under-the-surface natural hazards, archaeologists believe that hundreds of ships have been wrecked there over the centuries and even up until World War II," noted Faynot.

Describing the project, the office of UNESCO's spokesperson said that thanks to the cooperation mechanism provided by the 2001 convention, UNESCO has launched, alongside eight partnering countries, a major campaign to study and safeguard this exceptional Skerki Bank site, noting that "this is essential for understanding the history of the Mediterranean."

Fay not explains that the team on the Alfred Merlin is actually tasked with two missions.

The first goal is on the Italian side. "Several shipwrecks were discovered there in '80s and '90s, mostly by American expeditions led (separately) by Robert Ballard and Anna Marguerite McCann. The idea is to go back to those shipwrecks and see how well they are doing now — to check if the wrecks are perfectly preserved or perhaps damaged because of fishing or looting."

The second part of the mission consists more of a survey. "On the Tunisian continental shelf, we know less what to expect. We could find a lot of wrecks, or maybe we'll find



nothing. It could be that many wrecks were looted over the years. We need to know what exactly is there in order to protect the area. This is the main goal of the project: to know in order to protect and also in order to facilitate access to the public to those resources ... those cultural resources of heritage."

**Please visit the site: <https://www.al-monitor.com/originals/2022/08/mediterranean-countries-take-archaeology-project-tunisian-coast>**

---

---

## **DNA ANALYSIS SHOWS GRIFFIN WARRIOR RULED HIS GREEK HOMELAND**

The Bronze Age leader was from the region he would come to rule

Summary: Using new scientific tools, archaeologists discovered that an ancient Greek leader known today as the Griffin Warrior likely grew up around the seaside city he would one day rule. The findings are part of three new studies that examined the ancient DNA of the Griffin Warrior and 726 other people who lived before and during the Bronze Age to learn more about their origins and movements across three continents surrounding the Mediterranean Sea. Share:

### **FULL STORY**

Using new scientific tools, University of Cincinnati archaeologists discovered that an ancient Greek leader known today as the Griffin Warrior likely grew up around the seaside city he would one day rule.

The findings are part of three new studies published in the journal *Science* that examined the ancient DNA of the Griffin Warrior and 726 other people who lived before and during the Bronze Age to learn more about their origins and movements across three continents surrounding the Mediterranean Sea.

Led by researchers from Harvard University and co-authored by experts from around the world, the papers demonstrate that between 5,000 and 7,000 years ago, people with ancestry from the Caucasus, a region between the Black and Caspian seas, moved west into Anatolia (now Turkey) and north into the steppe of Eastern Europe. Then around 5,000 years ago, people from Eastern Europe spread out across the European continent and into Western Asia and back to the Caucasus. They joined local populations, "creating a tapestry of diverse ancestry from which speakers of the Greek, Paleo-Balkan and Albanian languages arose."

"When we look at the rise of Mycenaean civilization, the ancient DNA supports the notion that it was a local phenomenon, not something imported from the outside," said co-author Jack Davis, a UC Classics professor and department head.

"The development of the state by the Mycenaean was indigenous to Greece," Davis said.

Among the remains studied for ancient DNA analysis was that of the Griffin Warrior, whose tomb was discovered in 2015 by Davis and UC Classics senior research associate Sharon Stocker.

Davis and Stocker found the tomb under an olive grove in Pylos, a coastal city in southern Greece. A forensic examination determined the remains belonged to a young man between 30 and 35 years old who came from obvious wealth. His tomb contained weapons, armor and precious artwork, including an ivory plaque emblazoned with the image of the mythological half-eagle, half-lion griffin that gave the warrior his nickname.

"We were interested in the local implications for our interpretation of what we found at Pylos but also within the broader Mycenaean civilization," Davis said.

Archaeology magazine heralded the UC Classics' project as the greatest archaeological discovery in Greece in the past 50 years.

Their revelations continued UC's storied tradition of exploration in Greece. Previously at Pylos, UC Classics professor Carl Blegen and his Greek colleague, Konstantinos Kourouniotis, unearthed the Palace of King Nestor, a figure mentioned by Homer in his epic poems.

While continuing their work on the Griffin Warrior, Davis and Stocker made a second startling find in 2018 of two nearby gold-covered tholos or beehive-shaped family tombs. Like the Griffin Warrior's tomb, the tholos tombs also contained a wealth of cultural artifacts and exquisite jewelry.

In 2016, Davis and Stocker turned to former UC anthropology professor Lynne Schepartz, now at the University of Arizona, to reconstruct the warrior's features. Now additional investigation using ancient DNA is helping to fill in details about the Griffin Warrior's life in Greece  
3,500 years ago.

"He was a young man, and wealthy, who served different functions: a religious or sacred function, as an outstanding warrior and as leader of his people," Stocker said.

"He was one of the first kings of Mycenaean Pylos. Until then there had been competing aristocratic families, which explains why there were multiple tholos tombs," Stocker said. "But the Griffin Warrior was one of the first individuals to unite all of these functions within society."

Stocker supervised the excavations of the Griffin Warrior and tholos tombs.

"This research addresses a bigger question about population dynamics. Where did the Greeks come from? We had no way of addressing that question without looking at genetic relationships," Davis said.

For the ancient DNA analysis, Davis and Stocker again turned to Schepartz to examine remains.

"Mycenaean tombs are difficult to study because their mortuary rituals involved repositioning of skeletons when newer interments took place in tombs that were used over generations," Schepartz said.

Schepartz, a co-author of the Science articles, took samples of the Griffin Warrior's petrous bone, a part of the skull near the inner ear that often preserves ancient DNA.

Ancient DNA is a powerful tool for researchers because it can shed light on how people are tied to each other and the places they lived.

UC researchers have used ancient DNA to learn more about the agricultural practices of the ancient Maya in Mexico's Yucatan Peninsula.

"This type of study is critical for our understanding of the ancient history of the region and the role of Mycenaeans in forming that history," Schepartz said.

Schepartz discovered that two tholos tombs and seven chamber tombs first uncovered by Blegen at the Palace of Nestor contained more individuals than researchers initially realized.

Schepartz subjected the samples to isotopic analysis to learn more about the diets of the ancient Greeks at Pylos. She found that males consumed more protein than females. The people interred in the tholos tombs likewise consumed more protein than those buried in the chamber tombs. High-protein diets are considered a barometer of good nutrition, which often correlates with status or wealth.

These findings correspond with what we know about ancient Greek rituals, she said.

"For example, the participation of males at feasts where meat was consumed is documented, but the participation of females may have been much less frequent," she said.

"For us, we're really interested in the relationships between the people buried in the tombs at Pylos and the wider population," Stocker said. "Ancient DNA is the only way to establish these relationships."

Ancient DNA also supports what UC's experts have suspected all along: the Griffin Warrior was from the region he would later rule. Davis said the new evidence refutes the suggestion that he was an invader or outsider.

"We've always been skeptical about that theory but weren't able to prove it except through DNA analysis," Davis said.

UC's contribution to the study was made possible in part by Blegen, the former department head of UC Classics, who had the foresight to preserve samples. In Turkey, Blegen showed that Homer's Iliad was based on historical events, including the sack of Troy during the Trojan War.

Working at Pylos in 1939, Blegen found more than 1,200 clay tablets with some of the first known European writing dating to 1250 B.C..

Blegen's work was interrupted by World War II, but he returned in 1952 to resume his investigation at Pylos and remained in Greece until his death in 1971.

"Blegen was ahead of his time in understanding that there would be better technology in the future," Stocker said. "He saved all of the human and animal remains from his excavation so we were able to go back and take samples of DNA he collected."

Likewise, Stocker said, her team has taken steps to preserve excavated material at its sites for tomorrow's archaeologists who likely will have advanced equipment or techniques at their disposal.

"We're very careful about saving intact a portion of what we have," Stocker said. "We know advances in technology will be made. It's important to preserve them for future generations to study."

Stocker said ancient DNA analysis is still in its infancy when it comes to anthropological surveys. At the moment, sample sizes are very small for statistical interpretation. But she is thrilled about where the research is going.

"It's definitely an exciting aspect of archaeology," Stocker said. "We look forward to continuing our collaboration."

\*\*\*\*\*

### **Story Source:**

Materials provided by University of Cincinnati. Original written by Michael Miller. Note: Content may be edited for style and length.

### **Related Multimedia:**

Excavations of the tomb of the Griffin Warrior  
<https://www.uc.edu/news/articles/2022/08/uc-analysis-shows-griffin-warrior-ruled-his-homeland.html>

### **Journal Reference:**

1. Iosif Lazaridis, Songül Alpaslan-Roodenberg, Ayşe Acar, Ayşen Açıkkol, Anagnostis Agelarakis, Levon Aghikyan, Uğur Akyüz, Desislava Andreeva, Gojko Andrijašević, Dragana Antonović, Ian Armit, Alper Atmaca, Pavel Avetisyan, Ahmet İhsan Aytek, Krum Bacvarov, Ruben Badalyan, Stefan Bakardzhiev, Jacqueline Balen, Lorenc Bejko, Rebecca Bernardos, Andreas Bertatos, Hanifi Biber, Ahmet Bilir, Mario Bodružić, Michelle Bonogofsky, Clive Bonsall, Dušan Borić, Nikola Borovinić, Guillermo Bravo Morante, Katharina Buttinger, Kim Callan, Francesca Candilio, Mario Carić, Olivia Cheronet, Stefan Chohadzhiev, Maria-Eleni Chovalopoulou, Stella Chryssoulaki, Ion Ciobanu, Natalija Čondić, Mihai Constantinescu, Emanuela Cristiani, Brendan J. Culleton, Elizabeth Curtis, Jack Davis, Tatiana I. Demcenco, Valentin Dergachev, Zafer Derin, Sylvia Deskaj, Seda Devejyan, Vojislav Djordjević, Kellie Sara Duffett Carlson, Laurie R. Eccles, Nedko Elenski, Atilla Engin, Nihat Erdoğan, Sabiha Erir-Pazarcı, Daniel M. Fernandes, Matthew Ferry, Suzanne Freilich, Alin Frînculeasa, Michael L. Galaty, Beatriz Gamarra, Boris Gasparyan, Bisserka Gaydarska, Elif Genç, Timur Gültekin, Serkan Gündüz, Tamás Hajdu, Volker Heyd, Suren Hobosyan, Nelli Hovhannisyan, Iliya Iliev, Lora Iliev, Stanislav Iliev, İlkay İvgin, Ivor Janković, Lence Jovanova, Panagiotis Karkanis, Berna Kavaz-Kındıgılı, Esra Hilal Kaya, Denise Keating, Douglas J. Kennett, Seda Deniz Kesici, Anahit Khudaverdyan, Krisztián Kiss, Sinan Kılıç, Paul Klostermann, Sinem Kostak Boca Negra Valdes, Saša Kovačević, Marta Krenz-Niedbala, Maja Krznarić Škrivanko, Rovena Kurti, Pasko Kuzman, Ann Marie Lawson, Catalin Lazar, Krassimir Leshtakov, Thomas E. Levy, Ioannis Liritzis, Kirsi O. Lorentz, Sylwia Łukasik, Matthew Mah, Swapan Mallick, Kirsten Mandl, Kristine Martirosyan-Olshansky, Roger Matthews, Wendy Matthews, Kathleen McSweeney, Varduhi Melikyan, Adam Micco, Megan Michel, Lidija Milašinović, Alissa

Mitnik, Janet M. Monge, Georgi Nekhrizov, Rebecca Nicholls, Alexey G. Nikitin, Vassil Nikolov, Mario Novak, Iñigo Olalde, Jonas Oppenheimer, Anna Osterholtz, Celal Özdemir, Kadir Toykan Özdoğan, Nurettin Öztürk, Nikos Papadimitriou, Niki Papakonstantinou, Anastasia Papatasiou, Lujana Paraman, Evgeny G. Paskary, Nick Patterson, Ilian Petrakiev, Levon Petrosyan, Vanya Petrova, Anna Philippa-Touchais, Ashot Piliposyan, Nada Pocuca Kuzman, Hrvoje Potrebica, Bianca Preda-Bălănică, Zrinka Premužić, T. Douglas Price, Lijun Qiu, Siniša Radović, Kamal Raeuf Aziz, Petra Rajić Šikanjić, Kamal Rasheed Raheem, Sergei Razumov, Amy Richardson, Jacob Roodenberg, Rudenc Ruka, Victoria Russeva, Mustafa Şahin, Ayşegül Şarbak, Emre Savaş, Constanze Schattke, Lynne Schepartz, Tayfun Selçuk, Ayla Sevim-Erol, Michel Shamoon-Pour, Henry M. Shephard, Athanasios Sideris, Angela Simalcsik, Hakob Simonyan, Vitalij Sinika, Kendra Sirak, Ghenadie Sirbu, Mario Šlaus, Andrei Soficaru, Bilal Söğüt, Arkadiusz Sołtysiak, Çilem Sönmez-Sözer, Maria Stathi, Martin Steskal, Kristin Stewardson, Sharon Stocker, Fadime Suata-Alpaslan, Alexander Suvorov, Anna Szécsényi-Nagy, Tamás Szeniczey, Nikolai Telnov, Strahil Temov, Nadezhda Todorova, Ulsi Tota, Gilles Touchais, Sevi Triantaphyllou, Atila Türker, Marina Ugarković, Todor Valchev, Fanica Veljanovska, Zlatko Videvski, Cristian Virag, Anna Wagner, Sam Walsh, Piotr Włodarczak, J. Noah Workman, Aram Yardumian, Evgenii Yarovoy, Alper Yener Yavuz, Hakan Yılmaz, Fatma Zalzala, Anna Zettl, Zhao Zhang, Rafet Çavuşoğlu, Nadin Rohland, Ron Pinhasi, David Reich. **The genetic history of the Southern Arc: A bridge between West Asia and Europe.** *Science*, 2022; 377 (6609) DOI: [10.1126/science.abm4247](https://doi.org/10.1126/science.abm4247)

\*\*\*\*\*

Please visit the site:

<https://www.sciencedaily.com/releases/2022/08/220825163957.htm> [Go there for references and Biblio]

---

## **SWEEPING GENETIC STUDY OF ANCIENT EURASIANS REVEALS THOUSANDS OF YEARS OF HISTORY**

Three new papers detail the population genetics of Eurasian people spanning over 10,000 years.

Three new scientific papers provide a fascinating and comprehensive analysis of the genomes of 777 humans who lived from the Neolithic period (about 10,000 years ago) to the Ottoman period (around 1700 CE). Altogether, the research adds nuance to the story of human dispersal and connection since the dawn of civilization.

Ancient DNA for the research came from sources representing a diversity of people across time. Some of the people were elites in their day: One sample came from the tomb of a young, apparently wealthy man who died in Minoan Crete, nicknamed the Griffin Warrior.

Another came from the Amesbury Archer, another wealthy man who was buried in Wessex, near Stonehenge, some 4,300 years ago. Twenty-six people entombed in an Armenian Necropolis in the Late Bronze and Early Iron ages were included, while plenty more came from farming populations across West Eurasia.

The analysis—conducted by a vast, interdisciplinary team of over 200 researchers, including geneticists and genomicists, archaeologists, and human evolutionary biologists—has clarified the migrations of some ancient human populations and how groups of people across Eurasia interacted. Their research is published in the journal *Science*.

“We think this data will be useful in itself, as it describes thoroughly the Big Picture of the Eastern Mediterranean across time.

Other researchers can use our data to infer the ancestry of migrants elsewhere,” said Iosif Lazaridis, a geneticist at Harvard University and lead author of the research, in an email to Gizmodo. “The map of migrations of the past, both large and of isolated individuals, is becoming clearer!”

The research comprises three studies. The first study outlines 10,000 years of genomic history in the Southern Arc, a region that can generally be described as westernmost Asia and southeastern Europe.

The Southern Arc is important because it’s where some of the earliest farming cultures emerged, as well as early pottery cultures. The region (specifically the Fertile Crescent, which is in the Southern Arc) is often considered the “Cradle of Civilization.” The best way to refer to the region, though, is debatable.

“The naming of the Southern Arc conjures a map projection that centers on the western tip of Eurasia rather than the Anatolian peninsula—a more intuitive geographic center of the research area,” wrote Benjamin Arbuckle and Zoe Schwandt, anthropological

archaeologists at UNC-Chapel Hill who were unaffiliated with the recent work, in an accompanying Perspectives article. “Moreover, in terms of scale, narratives based on genomes often project a high-altitude view of history, mostly devoid of individuals despite being derived from its most personal components.”

“With this approach, history is made through vague processes of migration and admixture, but the social mechanisms remain uncharted,” Arbuckle and Schwandt added.

A chief finding of the first paper was that ancient speakers of Indo-European languages are linked to the Yamnaya culture, a group of steppe pastoralists that lived north of the Black and Caspian seas.

Based on the genetic variation amongst the hundreds of ancient individuals whose DNA the team sequenced, the Yamnaya culture expanded south into the Southern Arc.

“By comparing Anatolian samples with their neighbors, we can see that the steppe influence didn’t reach Anatolia,” Lazaridis said. “We hypothesize that the speakers of Anatolian languages (such as Hittite and Luwian) came from the east and not from the steppe; the steppe was responsible only for Indo-European languages, i.e., the linguistic ancestors of Greek, Armenian, Sanskrit, English etc.”

The second paper introduced the first ancient DNA (aDNA) sequenced from the Pre-Pottery Neolithic culture in Mesopotamia (what is now southeastern Turkey and northern Iraq), Cyprus, and northwestern Iran.

The work also identified at least two dispersals of humans from the Fertile Crescent into Anatolia.

“The genetic results lend support to a scenario of a web of pan-regional contacts between early farming communities,” said Ron Pinhasi, a biological anthropologist specializing in ancient DNA at the University of Vienna and a co-author of the work, in a university release. “They also provide new evidence that the Neolithic transition was a complex process that did not occur just in one core region, but across Anatolia and the Near East.”

The third work probed the ancestral connections of individuals from Southern Europe and West Asia; some particular findings were that Greek elites in Mycenae were genetically similar to the general population, and there wasn’t much mixing between people in Eastern Turkey and Southern Armenia (then Urartian) with steppe populations.

“The ancient source populations are very differentiated from one another, and the authors find over the past 10,000 years a reduction of this differentiation as populations carrying these ancestries mixed (‘homogenization’),” said Mohamed Almarri, a geneticist at the Sanger Institute in England who was unaffiliated with the research, in an email to Gizmodo.

“However, this process was not uniform, and to me this one of the main highlights of the papers,” Almarri added. “By comparing the source proportions across time and space in their samples, they find differences in many locations, which raises questions on why did these patterns evolve.”



The third work also found that people in ancient Anatolia remained genetically distinct from other populations through the Byzantine period and represented “the demographic core of much of the Roman Empire,” as the paper put it.

“[The researchers] have produced an astounding dataset, unimaginable in its scale just a decade ago,” Arbuckle and Schwandt wrote. “Moving forward, the growing corpus of ancient genomic data will continue to transform views of human history. This work can be particularly effective if researchers recognize their lack of neutrality and embrace their role in constructing narratives while allowing room for diverse perspectives that shine light onto people and places whose histories are less well known.”

As aDNA sequencing methods improve, scientists will be able to extricate more nuances of human dispersal and intermingling through time. The story of us—where we all came from, and the connected question of who we are—can be spelled out on a base-pair level.

**Please visit the site: <https://gizmodo.com/sweeping-genetic-study-of-ancient- Eurasians-reveals-tho-1849457794> [Go there for pix]**

---

---

## **RECENT STUDY CONDUCTED ON TUTANKHAMUN’S SANDALS REVEAL ASTONISHING FINDINGS, BY MUSTAFA MARIE**

Can you believe that young King Tutankhamun had a great collection of footwear?

The astonishing discovery of Tutankhamun's Tomb [KV62] by Howard Carter was one of the most exciting discoveries ever. This discovery made headlines around the world in the 1920s, while Tutankhamun's golden funerary mask has become an iconic symbol of ancient Egypt.

Recently, experts have conducted an in-depth study of the king's sandals.

The study reveals that the exact number of sandals is unclear. At least 80 samples have been discovered in the virtually intact tomb of King Tut, which were included in order to accompany him into the afterlife. Some have been found in surprisingly good condition, most notably the golden sandals that were discovered on the feet of the mummy of King Tut, according to the ancient-origins website.

André Feldmeier, Dutch archaeologist and author of “Tutankhamun's Shoes: Studies of Ancient Egyptian Shoes”, conducted a study of 81 specimens housed in the Luxor Museum and the Egyptian Museum in Cairo.

This was all that was left of the vast collection of shoes that was buried with Tutankhamun. It is a collection that included sewn sandals and beaded sandals. These were a feast for the eyes, made of gold, birch bark, plant fibers, precious stones, and leather.

DNA tests and CT scans of his remains revealed that King Tutankhamun may have had birth defects caused by inbreeding, including club feet and deformities in his feet that would have made him walk limp and required the use of a stick. Three pairs of shoes were found to have horizontal foot straps under the toes that could have been constructed to aid walking. These features are not known in any other shoe or sandal.

Please visit the site: <https://tinyurl.com/4wecdkjk> [Go there for pic]

---

## **FALLING WATERS OF EUPHRATES, TIGRIS** **RIVERS REVEAL SUBMERGED** **ARCHAEOLOGICAL SITES,** **BY MOHAMMED HARDAN**

The drop of the water levels in recent years has uncovered many archaeological and ancient sites that were submerged beneath the two historic rivers in Syria, Iraq and Turkey.

The decline of water levels at the Euphrates Dam lake in eastern Syria recently revealed a large archaeological burial site.

The site, which dates back to the Byzantine civilization in the Raqqa province, stretches over large areas on the eastern bank of the Euphrates Dam (also known as Tabqa Dam) lake, starting from Wadi Sahl al-Khashab and Shams al-Din area in the northwestern countryside of Raqqa until the administrative border between Raqqa and Aleppo.

The drop of the Euphrates and Tigris waters during the past three years has uncovered many archaeological sites that were submerged in the waters of the two rivers that cross through Syria, Iraq and Turkey.

Water levels in the Euphrates River have reached dangerously low levels in recent years. The flow from Turkey toward Syrian territory is below 200 cubic meters per second, which is less than half the quantity agreed upon between the two countries in 1987.

Abdul Razzaq al-Aliawi, an engineer and former director of Syria's maintenance department for the Euphrates River, told Al-Monitor, "The Euphrates River bed witnessed six historical eras, including the Sumerian, Akkadian, Assyrian, Greek, Byzantine, in addition to the Islamic era." Building dams in the first place, he said, was "an unjust decision."

The Syrian government of Youssef Zain in 1968 built the Euphrates Dam without diverting the Euphrates River to the desert and establishing lakes there. Instead, Aliawi said, "The dam's lake was formed with a length of 100 kilometers and a width of 8 kilometers and inundated the most prominent ancient sites in the river. Only a few artifacts and monuments were saved."

As the water level drops, he said, "many cemeteries are located in this area, which is also believed to include [hundreds] of Syriac Christian monasteries. The cemeteries that are still submerged can be seen clearly when it is sunny and the lake water is clear." A few cemeteries have been found on the right bank of the lake in the western region of Raqqa, he said, but the left bank "is more rocky, making it difficult to carry out digging works."

In July, the receding waters of the Euphrates River in the city of Anah in Iraq revealed the ancient city of Talbes. Mohammad Jassim, an Iraqi archaeologist, reported the emergence of at least 80 historic sites due to the decrease in the water level of the Haditha Dam.

On June 6, the Department of Antiquities in Dohuk in the Kurdistan Region of Iraq announced the discovery of a city from the Mitanni Empire, dating back 3,400 years, which emerged when the waters of the Tigris River basin receded.

The director of the Dohuk Department of Antiquities, Bees Privkani, told reporters June 6 that the city, known historically as Zakhiko, was mentioned in Babylonian texts. It includes a palace and several other buildings, in addition to a large fence, he said, and cuneiform texts were also found.

Last year, the receding waters in the Keban Dam lake on the Euphrates River in the Ağın region in eastern Turkey brought to the surface the historical Hastek Castle, which can only be reached by boat.

According to the head of the history department at the Firat (Euphrates) University in Turkey, Korkmaz San, the castle is believed to be a temple dating back to the pre-Christian era. He explained in a press statement at the time that the castle consists of three floors carved inside the rocks, with Greek inscriptions on its inner walls.

Saad Fansa, who worked for nearly 30 years at the National Museum of Damascus as director of the Photographic Archive and the Documentary Archive of Syrian Antiquities at the museum, told Al-Monitor, “The receding water bed of the Euphrates River and the discovery of archaeological sites is not new. Similar sites resurfaced in the 1980s when the dam lake water level dropped.”

He added, “One of the most important sites that was flooded by the Euphrates Dam water when Lake Assad was established was the site of Mureybet, an ancient settlement mound dating back to the Neolithic era. This discovery provided insights on the development of agriculture in the region along with the deification of women at the time.”

Fansa continued, “The Euphrates River crosses Syria and Iraq, the Tigris flows from Turkey to Iraq. Due to the global drought, [submerged] archaeological sites will keep resurfacing in these countries.”

**Please visit the site: <https://www.al-monitor.com/originals/2022/08/falling-waters-euphrates-tigris-rivers-reveal-submerged-archaeological-sites>**

---