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# Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

**- Αύγουστος 2022 -**

**It is better to destroy one's own errors than those of  
others.**  
*(Democritus)*

## Newsletter of the Hellenic Society of Archaeometry

**- August 2022 -**

**Nr. 257**

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## **ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS**

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

Dear all,

Abstract submission for the 24<sup>th</sup> Radiocarbon and the 10<sup>th</sup> Radiocarbon & Archaeology Conferences has closed. We received more than 400 abstracts and we are looking forward to getting together again in person and to celebrate an exciting meeting in September. The program committee is working on the session allocation and will send out statements of acceptance soon (not later than the second week of July).

In the meantime, we have set up the conference registration webpage. You will find details on the registration options at: [https://radiocarbon24.ethz.ch/?page\\_id=54](https://radiocarbon24.ethz.ch/?page_id=54).

During the registration process, you will be able to select additional conference activities, which are briefly explained below.

Sunday, September 11, will be devoted to workshops. You may attend a morning and/or an afternoon workshop. Please have a look at [https://radiocarbon24.ethz.ch/?page\\_id=1096](https://radiocarbon24.ethz.ch/?page_id=1096) to find out more. Get in contact with the workshop conveners in case you would like to contribute. Workshop attendance is included in the registration fee.

The onsite registration for the conference will open on Sunday, September 11, in the afternoon, at ETH Campus Hönggerberg, where we want to invite you for a welcome Apéro.

On Monday, September 12, you will have the opportunity to visit Ionplus AG. Details of the site visit can be found at: [https://radiocarbon24.ethz.ch/?page\\_id=1726](https://radiocarbon24.ethz.ch/?page_id=1726). If you want to participate, please check the related box during the registration procedure. The visit is sponsored by Ionplus AG, so it is free of charge.

On Tuesday afternoon, September 13, you can take part in our excursion program. You will have the chance to explore various attractions in and around Zurich City. Visit [https://radiocarbon24.ethz.ch/?page\\_id=1005](https://radiocarbon24.ethz.ch/?page_id=1005) to find details on the different tours. Please select for your preferential tour and also let us have your alternative choice to facilitate the planning.

The Conference dinner will take place on Wednesday, September 14. The dinner is not included in the registration fee, you will have to select it separately for you and your accompanying person.

You may have realized that there are two options to register for the conference. Note that your registration for the 10<sup>th</sup> <sup>14</sup>C & Archaeology Conference will give you only access to the Monday to Wednesday program (Sessions T & A) and the Sunday workshops. With your registration for the 24<sup>th</sup> Radiocarbon Conference access to all selected conference activities will be granted throughout the week (all sessions and workshops).

In any case, we encourage you to take advantage of the early bird registration option, which is available until Aug 1<sup>st</sup>.

With kind regards,

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

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**SUNRISE SUMMER SCHOOL “SEASHORE  
AND UNDERWATER DOCUMENTATION OF  
ARCHAEOLOGICAL HERITAGE  
PALIMPSESTS AND ENVIRONMENT”, 3-9  
SEPTEMBER 2022, RAGUSA – SICILY, ITALY**

Dear friends and colleagues,

There are still few places available for the **SUNRISE** summer school SEASHORE AND UNDERWATER DOCUMENTATION OF ARCHAEOLOGICAL HERITAGE PALIMPSESTS AND ENVIRONMENT which will be held in **Ragusa** – Sicily, **Italy** from **3-9 September 2022**.

The **SUNRISE** summer school will be carried out in cooperation between **ISPRS** and **SIFET** (Italian Society of Photogrammetry and Topography) and will involve international students and professional surveyors with different backgrounds (e.g. archaeologists, architects, engineers, etc.) for the documentation of an archaeological site and the surrounding environment with several geomatic techniques.

The main objective is to provide the participants with a general overview of the state of the art of the different **geomatic techniques** that can be used for the documentation of both the **Cultural Heritage** (emerged and submerged) and the environment in which it is located, constituting the **coastal heritage**.

The number of participants is limited to 20.

Registration fee is **250€ per person**, including accommodation and meals (travel cost is not included).

Travel grants are available filling the application form.

For further information please visit the website of the event (<https://www.sunrisesummerschool.com/>)

On behalf of all the **SUNRISE** summer school organizers,

Kind regards,

Fabio

\*\*\*\*\*

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Web: <http://3dom.fbk.eu/>

Web: <http://www2.isprs.org/commissions/comm2/wg9.html>

\*\*\*\*\*



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

**JOB OPENING: RESEARCH ASSOCIATE (2**  
**YEAR) AT THE METROPOLITAN MUSEUM**  
**OF ART'S DEPARTMENT OF SCIENTIFIC**  
**RESEARCH**

This role entails scientific analytical development and optimization tailored to the collaborative interrogation of complex cultural heritage materials under the supervision of a Research Scientist. Duties will include developing, implementing, and evaluating novel mass spectrometric (MS) approaches for the study of composite samples from artworks for the explicit purpose of identifying chia oil. This is a two-year full time position funded by the National Endowment for the Humanities.

Please use this link to find a complete job description and to apply:

<https://metmuseum.wd5.myworkdayjobs.com/en-US/metmuseumcareers>

The salary is \$63,000/ year.

\*\*\*\*\*

[Julie] [Arslanoglu]  
[Research Scientist]  
[The Metropolitan Museum of Art]  
[New York] [NY]

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## **ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS**

### **«ΝΑΝΟΣΥΣΤΗΜΑΤΑ: ΕΡΕΥΝΑ ΚΑΙ ΕΦΑΡΜΟΓΗ ΣΤΗΝ ΠΟΛΙΤΙΣΤΙΚΗ ΚΛΗΡΟΝΟΜΙΑ», ΣΧΟΛΗ ΕΦΑΡΜΟΣΜΕΝΩΝ ΤΕΧΝΩΝ ΚΑΙ ΠΟΛΙΤΙΣΜΟΥ, ΠΑΝΕΠΙΣΤΗΜΙΟ ΔΥΤΙΚΗΣ ΑΤΤΙΚΗΣ, ΠΑΝΕΠΙΣΤΗΜΙΟΥΠΟΛΗ ΆΛΣΟΥΣ ΑΙΓΑΛΕΩ, 7 ΟΚΤΩΒΡΙΟΥ 2022, 9:00-17:30**

#### **ΕΚΔΗΛΩΣΗ ΕΝΔΙΑΦΕΡΟΝΤΟΣ**

##### **Εξειδικευμένο Σεμινάριο**

Το Εργαστήριο “ARTICON: Συντήρηση - Ανάδειξη Εικαστικών Έργων, Βιβλιακού & Αρχαϊκού Υλικού” του Πανεπιστημίου Δυτικής Αττικής, με αφορμή την έναρξη του Ευρωπαϊκού Προγράμματος EU HORIZON - 2021 - GREENART, οργανώνει εισαγωγική εκδήλωση - σεμινάριο με τίτλο: **«Νανοδομημένα: έρευνα και εφαρμογή στην πολιτιστική κληρονομιά».**

Σκοπός του σεμιναρίου είναι η γνωριμία και εξοικείωση των επιστημόνων και των επαγγελματιών του χώρου με την εφαρμογή των νανοϋλικών στη συντήρηση της πολιτιστικής κληρονομιάς. Το σεμινάριο επικεντρώνεται σε δύο βασικές ενότητες:

1. Διαλέξεις και παρουσιάσεις σχετικά με τις θεωρητικές, ερευνητικές και εφαρμοσμένες πτυχές των νανοϋλικών στην διατήρηση της πολιτιστικής κληρονομιάς. **Η ενότητα θα είναι ανοιχτή στο ευρύ κοινό με τους ισχύοντες περιορισμούς κατά της πανδημίας.**
2. Δύο πρακτικά εργαστήρια σχετικά με τις μεθοδολογίες εφαρμογής και τη χρήση ορισμένων νανοδομημάτων σε χαρτώο υλικό και ζωγραφικά έργα (Ομάδα 1), καθώς επίσης σε μεταλλικά αντικείμενα (Ομάδα 2), **για περιορισμένο αριθμό συμμετεχόντων.**

Στο σεμινάριο θα διδάξουν οι διακεκριμένοι επιστήμονες Piero Baglioni, Antonio Mirabile, και Gabriella Di Carlo με τη συμβολή μελών του εργαστηρίου ARTICON και του Τμήματος Συντήρησης Αρχαιοτήτων και Έργων Τέχνης.

**Δικαίωμα συμμετοχής στο εργαστηριακό μέρος** του σεμιναρίου έχουν πτυχιούχοι συντηρητές και επαγγελματίες της συντήρησης αρχαιοτήτων και έργων τέχνης, με πιστοποιημένη γνώση της αγγλικής γλώσσας. **Μέγιστος αριθμός** συμμετεχόντων για την Ομάδα 1 είναι τα **20 άτομα**, ενώ για την Ομάδα 2, τα **10 άτομα**. Το κόστος συμμετοχής στα εργαστήρια είναι 50€ και περιλαμβάνει την παροχή εργαστηριακού εξοπλισμού και αναλωσίμων.

Οι ενδιαφερόμενοι θα πρέπει να υποβάλουν ηλεκτρονική αίτηση εκδήλωσης ενδιαφέροντος μέχρι **31 Αυγούστου 2022**.

Για την ΑΙΤΗΣΗ ΕΚΔΗΛΩΣΗΣ ΕΝΔΙΑΦΕΡΟΝΤΟΣ πατήστε [εδώ](#).

*Θα τηρηθεί σειρά προτεραιότητας.*

Αναλυτικές πληροφορίες μπορείτε να δείτε στο σύνδεσμο [http:// articon.lab.uniwa.gr](http://articon.lab.uniwa.gr)  
ή να επικοινωνήσετε μαζί μας στη διεύθυνση [articon@uniwa.gr](mailto:articon@uniwa.gr)

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

# **TOWARDS THE BORDERS OF THE BRONZE AGE AND BEYOND MYCENAEAN LONG DISTANCE TRAVEL AND ITS REFLECTION IN MYTH, BY JÖRG MULL**

Paperback, 162 pp.

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Sidestone Press

The Late Bronze Age from about 1600 to 1150 BCE was a time of unprecedented economic activity in human history based on the supply and production of the eponymous alloy bronze on an almost industrial scale. The supply networks for copper and tin during this period stretched over large parts of western Eurasia and included long distance maritime transport.

The palatial centres of Mycenaean Greece were positioned at a unique geographical interface between the cultural hotspots of the eastern Mediterranean as well as the metal supply sources in the western Mediterranean, northern Europe and the Black Sea area. There are archaeological and historical indications that Mycenaeans somehow contributed either directly or indirectly via intermediaries to the exchange of goods in the second half of the 2nd millennium BCE.

However, and partially due to limitations of archaeological and historical evidence, the degree to which the Mycenaean Greeks conducted long distance commercial journeys themselves to participate in the metal trade of the period is still disputed.

Mull analyses the large corpus of the Greek myths, some of which are likely to go back to Bronze Age roots and which contain evidence of long distance journeys of Mycenaean pioneering adventurers. Mull, after an education in classical languages, became a trained economist with almost 30 years of experience in international business. From this unusual vantage point he provides a fresh perspective on what is known about travel and trade during the Late Bronze Age, a discipline so far dominated by archaeologists and historians.

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Please visit the site: <https://www.sidestone.com/books/towards-the-borders-of-the-bronze-age-and-beyond> [Go there to read online]

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# **SKYSCAPE IMPACT TO CULTURAL ASTRONOMY, BY I. LIRITZIS AND A. VLACHOS**

SCIENTIFIC CULTURE, Vol. 8, No. 3, (2022), pp. 131-155

DOI: 10.5281/zenodo.6640243

## ABSTRACT

Since the early days of mankind, humans have looked to the stars for answers to their biggest questions, expecting the fulfilment of the most basic need to comprehend the universe they inhabit, both from a scientific perspective and from other cultural standpoints. The skyscape has been the source of inspiration, imagination, for science and philosophy. The dual interaction between man and the skyscape, so-called cultural astronomy and/or archaeoastronomy, concerns with cultural, artistic, everyday perceptions and understandings of astronomical phenomena, and forms a rich cross-disciplinary field. The determination of time and identification of human or animal images from the starry configurations has exerted a strong influence on the human cultures throughout the millennia. The four solar stands, the lunar phases, the planetary orbits, the rise and setting of bright stars and the constellations have triggered past societies to determine the time for daily works. In essence, the determination of time was deemed necessary for many daily aspects. World examples from the five continents on these aspects are outlined, focused on the determination of time with solar stands in daylight, the lunar periodic movements, and bright stars and associated configurations (constellations). Seven broad categories are recognized: Cat. 1: Religion, Rituals and Funeral Rites; Cat. 2: Mythology; Cat. 3: Art (Music, Painting, Rock Art, Poetry & Literature); Cat. 4: Travel (Maritime & Mainland long distance voyages); Cat. 5: Agriculture; Cat. 6: Observation/Measurement of Time; Cat. 7: Daily life. These all have intimate relationships with the orbits, appearances, directions of rising and setting of bright celestial bodies. Together with the constructed devices for the determination of time and geographical location (sundials, hydraulic and portable devices, topographical markers), including intangible oral documentation of cultural astronomy of aboriginals, led humans to the development of portable devices and monumental (natural or intentionally made) constructions and orientation marking (archaeoastronomical orientations). A compressed overview on this dual relationship shall be critically reviewed.

KEYWORDS: archaeoastronomy, stars, calendar, time, ancient cultures, continents, religion, sundial, constellations, orientation

Please visit the site: <https://euro-acad.eu/CMS/tinymce/js/tinymce/plugins/filemanager/source/Dateien/Skyscape%20impact%20to%20Cultural%20Astronomy.pdf>

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## **EΙΔΗΣΕΙΣ - NEWS RELEASE**

# **SUMMARY AND ANALYSIS: NEW ARTICLE SUGGESTS A SLUICE GATE WAS USED TO CONTROL WATER LEVELS IN THE SILOAM TUNNEL**

If correct, this study claims to have identified the oldest sluice gate in the world, but the suggestion is not without significant problems Chandler Collins

I recently saw Ticia Verveer share a new and interesting open-access article about the Siloam Tunnel which appeared in *Archaeological Discovery*: “A Sluice Gate in Hezekiah’s (Iron Age II) Aqueduct in Jerusalem: Archaeology, Architecture and the Petrochemical Setting of Its Micro and Macro Structures” by Aryeh Shimron (Geological Survey of Israel) and Vitaly Gutkin and Vadimir Uvarov (Center for Nanoscience and Nanotechnology at Hebrew University). I had a chance to read through the article and felt compelled to present a summary and analysis of it here.<sup>1</sup>

The entrance from the area of the Gihon Spring (Umm ad-Daraj) to Channel VI, which leads visitors to the Siloam Tunnel, known popularly as “Hezekiah’s Tunnel.” The first step in is always a doozy.

### **Summary**

Shimron et al argue that a previously undetected sluice gate was used to control water levels in the Siloam Tunnel which was hewn as part of King Hezekiah’s preparations for the coming Assyrian campaign in the late 8th century BCE.<sup>2</sup> If they have correctly identified this gate, it would apparently be the oldest known example from the ancient world (81). The gate was wooden and has long since deteriorated, but evidence of its presence is suggested by the remains of four nails that were found hammered into the walls of the tunnel (photo below).

The nails were tested and shown to be made of wrought iron (95-97).

They also contained traces of petrified wood that may be cedar and are understood by the authors to be remains of the sluice gate (98-99).

The proposed area of the sluice gate is exactly where the tunnel begins to rise dramatically toward its southern end vs. the northern portion of the tunnel which is much lower. Many who walk through this area are struck by the dramatic change in the height of the ceiling (I have to walk parts of the tunnel bent over and at this point can stand up comfortably). This theory would account in part for the sudden rise of the ceiling. Shimron et al also believe there is evidence nearby that the northwestern wall was being deliberately shaped for the “emplacement” of the Siloam Tunnel Inscription.<sup>3</sup>

The authors note that the bedrock on either side of the tunnel in the area of the gate is not symmetrically shaped for the mounting of the sluice gate (92). They suggest some later

activity in the area may account for how the stone was reshaped after the Iron Age. There was some very interesting evidence of such activity from the Mamluk Period found in mortar on the nearby ceiling (91-92, 94; see below).

A schematic reconstruction of the sluice gate in the Siloam Tunnel showing where the iron nails were located and the proposed wool cable that was used to open and shut it (from Shimron et al 2022:84). The view is in the direction of the outlet of the tunnel. The frame conceals the bedrock to which it would have been mounted. However, it does not appear to have been shaped to receive the mount.

Shimron et al interpreted nearby remains on the ceiling as a bolt which may have been used to hold the cable that operated the gate.

Remains of what they understand as calcified wool was found on the ceiling next to the bolt, suggesting that the cable was made of that material. It would have needed to run along the ceiling of the Siloam Tunnel to a shaft to the surface some 30 meters (98 feet) away. There they suggest the cable ran either to the surface or to the inside of Channel II where the sluice gate could be operated safely from the inside the city walls (81). The cable needed to be ca. 50 m (164 ft.) long in order for this to be possible (80-81).

The study also revealed unrelated but interesting details about the quality of the spring water. Chemical analysis of the nails and the tunnel in areas close by showed changes in the water over time. This includes a rise in the pH levels perhaps due to sewage from Jerusalem's urban expansion (in the 19th century and following) and chlorine that was added to the water supply in the 1970s (100, 106, 109).

Now we come to some important issues related to the interpretation of the sluice gate within the context of the Jerusalem water system. The authors reason that the gate was needed because the Siloam Tunnel sits at a lower level (ca. 635 m. = 2,083 ft. above sea level) than other key areas of water access closer to the spring (ca. 637 m. = 2,089 ft.). They argue that the objective of adding a sluice gate was to raise the water level in the Siloam Tunnel in order to inundate the older elements of the water system that sat at a higher elevation level. The article pinpoints three key parts of this system which were served in this way: Channel II, the Round Chamber, and the bottom of Warren's Shaft.

The spring (Umm ed-Daraj) emerges through a fissure below the bottom of these steps. Although it can't be seen, those who stand nearby can hear it emptying into the tunnel below quite clearly. Note the higher level (2 m. = 6.5 feet higher) of the old Canaanite tunnel, "Channel II," which was dug in the Middle Bronze Age. As this area looks today, the water from the spring would have to bubble up significantly to reach the level of Channel II. The sluice gate proposed in this article would solve this problem by artificially raising the water level.

Channel II, an older Canaanite tunnel in Jerusalem's water system, sat at a higher elevation than the Siloam Tunnel (ca. 2 m. = 6.5 ft. higher). Before the spring water flow was diverted into the Siloam Tunnel in the 8th century BCE, it probably emerged from the bedrock and, with nowhere else to go, entered Channel II where it would flow southward.<sup>4</sup> From the Middle Bronze Age until the 8th century BCE, Channel II diverted the spring water southward along the Kidron Valley where it may have been used for irrigation or drinking.<sup>5</sup> Later in the 8th century, Channel II was extended further south



(see below). The opening up of the Siloam Tunnel at a lower elevation diverted the water away from Channel II.

A side channel coming off of Channel II, known as Channel III, brought water into a rock-cut Round Chamber that was apparently used as a bucket-drawn water reservoir by Jerusalem's inhabitants during the Middle Bronze Age and possibly until the 8th century BCE.<sup>6</sup> The authors of the article point out that after the cutting of the Siloam Tunnel, the diverted water would not have filled this important chamber.

The "Round Chamber" which Ronny Reich argues the city's inhabitants used for drawing water in the Middle Bronze Age. It was fed by Channel III which brought spring water here via Channel II. Channel IV seen at the top of the photo was cut later in the Iron Age II (8th century BCE).

The article's authors reason that after the Siloam Tunnel was cut, water also would not as easily have reached the area at the bottom of Warren's Shaft. Although the spring water flowed close by the area under the shaft, the opening up of the Siloam Tunnel would have had an impact on the amount of water that ended up there, limiting what could be drawn up by bucket. This assumes-as Shimron et al argue do-that the shaft was used to draw water from the top (see below).

So, to recap: the authors of this article argue that after the Siloam Tunnel was hewn and the spring was diverted there, water would no longer bubble up under sufficient pressure in order to rise 2 m. in elevation and (1) enter Channel II and run south along the Kidron Valley, (2) fill the Round Chamber via Channel II and III, or (3) sufficiently enter the area at the bottom of Warren's Shaft so that Jerusalem's inhabitants could draw water by bucket from the top.

What is their solution to these perceived issues? A sluice gate in the Siloam Tunnel that could temporarily raise the water level and allow the other elements of Jerusalem's water system to fill and continue to be used:

"The king's engineers were well aware that such a diversion [into the Siloam Tunnel] would significantly lower the water level in the northern water conduits and reservoirs (the cave beneath Warren's Shaft, the Round Chamber and Channel II, Figures 2-4). This would mean cutting off most of the water from the bulk of the city's population.

In order to overcome such a potentially fatal threat a mechanism was needed that would allow the water level in the tunnel to be raised and lowered as and when needed. For this purpose two major precautionary steps were taken prior to allowing water flow through the tunnel: 1) the many voids in the newly exposed highly fractured and karstified tunnel walls were sealed with hydraulic plaster up to an average height (~2 m) of the tunnel ceiling... and 2) a movable damming source was constructed at a favourable location in the tunnel." (Shimron et al 2022:72)

An ingenious solution but one that has some significant problems.

## **Analysis**

Shimron et al are to be commended for locating previously unknown remains in an area that has been surveyed by so many scholars. Their fascinating detailed chemical analysis of the Siloam Tunnel has given us new data to work with. However, I do not believe the study justifies the author's proposed rationale for or the supposed physical setting of the sluice gate. The biggest problem is evidence suggesting the older elements of Jerusalem's water system ceased to be used after the Siloam Tunnel was excavated. Hence if a sluice gate was installed in the tunnel, it could not have been for the reasons suggested in the article.

For example, when Ronny Reich and Eli Shukron excavated near the Round Chamber (part of which was originally discovered and excavated by Parker and Vincent in 1909), it was found to be full of 9th-8th century BCE debris, including bullae and fish bones, with an 8th century BCE house built on top.<sup>7</sup> Therefore, this space could not have continued to be used as a water reservoir in the 8th century when the Siloam Tunnel was hewn. The evidence suggests that it was deliberately put out of use.

Walls of a house from the 8th century BCE built on a large amount of debris that covered the area, showing the Rock-Cut Pool and adjacent lower Round Chamber ceased to be used at that time.

As for Channel II which (via its tributary Channel III) brought water into the Round Chamber, there is also evidence that it went out of use when the Siloam Tunnel was hewn. In Reich and Shukron's partial excavations of the channel, they found pottery dating to the 8th-7th centuries BCE in two layers on its floor.<sup>8</sup> They suggest this indicates the date that Channel II had ceased to be properly maintained, so it was no longer used.

The northern section of Channel II dating to the Middle Bronze Age, an open channel covered by boulders.

We can also reason that Channel II went out of use based on its termination point. A tunneling operation in the 8th century BCE-but probably earlier than the cutting of the Siloam Tunnel-extended Channel II southward toward the convergence of the Central and Kidron Valleys. It terminated at the southern end of the Southeastern Hill near where the later Pool of Siloam was built. Although a successful effort, the newly expanded channel was not used for long, perhaps because it was badly in need of repair and partially covered by massive boulders that were hard to move. For whatever reason, Jerusalem's leaders opted to hew out the Siloam Tunnel in order to divert water from the spring southward instead. Because both Channel II and the Siloam Tunnel terminated at essentially the same place, it is hard to understand why Channel II was needed at all after the hewing of the Siloam Tunnel.

The Southeastern Hill, the ancient core of the city that today sits outside the Old City walls and is part of the Arab village of Silwan in East Jerusalem. Channel II runs from the spring (the area of trees covered by "ns") along the eastern side of this hill and emptied at its southern foot (bottom left corner of the photo).

As for Warren's Shaft, I personally doubt that it was ever used to draw water, at least not in any substantial way. This is mainly due to its shape which shows that it was naturally formed and not manmade.<sup>9</sup> In 1952 the historian of Jerusalem John Simons wrote,

“The very inadequate shape of the cistern-shaft, one of the most vital parts of the project, is surprisingly disappointing, considering how much patience and energy was bestowed on the work as a whole.”<sup>10</sup>

If the shaft was used to draw water with a rope and bucket, we may ask with Simons why its sides were not more deliberately smoothed to better facilitate it. The deeply engrained presupposition that the shaft was used to draw water seems to be a hold-over from a time when much less about Jerusalem’s water system was known and great emphasis was placed on the function of the shaft. Recent excavations and analysis suggest an entirely new context for the water system which should deprive Warren’s Shaft of its former prestige.

Some scholars believe that a wall contemporaneous with the Siloam Tunnel was built in front of the area below Warren’s Shaft to prevent water from being diverted there and to ensure that it more directly flowed into the Siloam Tunnel. On this view, Warren’s Shaft is seen as no more than a temporary means to remove stone chips from the Siloam Tunnel as it was being hewn (the well-known stepped entrance leading to the spring today was not cut until much later).

Looking down Warren’s Shaft from the top, a familiar view to many visitors of the water system. It was once thought to be an important part of Jerusalem’s water system that facilitated the collection of water by bucket from inside the city walls. It was also erroneously popularized as the *şinnor* (“water shaft”?) mentioned in II Samuel 5 that David’s commander Joab used to access and conquer the city.

Several other issues complicate the interpretation presented in this article. For example, the authors do not provide direct dating evidence for the sluice gate. Hinting at this problem, they write “The device, if proven to date to Iron Age II, is—to the best of our knowledge, the oldest sluice gate known and now recorded” (108, emphasis mine). They suggest an 8th century BCE date for the gate based on indirect evidence: the dating of the high water lines ca. 1.5 m. above the tunnel floor. Remains embedded within the hydraulic plaster and later deposits upon it, at the level of the water lines, were dated to between the 8th-4th centuries BCE (79). This leads the authors to suggest that there was water level control in the tunnel during this period (83). However, they cannot demonstrate a connection between the evidence of water control and the remains of the supposed sluice gate by direct dating of the nails or other nearby remains. It is also unclear why water level control would have been needed after Jerusalem’s destruction in 586 BCE. Perhaps another explanation would account for these water lines in the Siloam Tunnel.

Another potential issue is the location of the sluice gate and manner it would have been mounted. Considering that in the proposed location the gate would have needed to contain the pressure of water flow for nearly the entire tunnel, one wonders if just four nails on part of the frame were enough to hold it in place. Perhaps construction of a sluice gate closer to the spring would have better suited the objectives laid out in the article. The authors also mention that the sides of the tunnel in the area of their sluice gate lack symmetry.

This seems strange given the ability shown by the Judahite engineers to cut the tunnel effectively. Surely they could have shaped the tunnel walls to hold the gate's frame securely in place. As Shimron et al reason, maybe this area was altered later, but that is so far a suggestion without evidence.

It also seems peculiar that the shaft to the surface, through which the supposed wool cable ran that operated the sluice gate, was 30 m away. Were the engineers not capable of cutting a shaft from the area of the gate upwards in order to have more direct control over its operation? The authors make much of the fact that the location of the shaft to surface was near the point where the Siloam Tunnel and Channel II almost converge (80-81), but it is not clear what made this convergence so important or why it would have dictated the location of the sluice gate 30 m. away.

### **Conclusion**

The ideas in this article were fascinating to read and consider. In the end I am unable to accept the understanding of the water system presented by the authors into which the proposed sluice gate was integrated. If, as Shimron et al suggest, the sluice gate was in use from the 8th-4th centuries BCE, then we must search for a new historical rationale for creating such a gate. It could not have served the older parts of the water system that went out of use after the Siloam Tunnel was hewn. Might there be another valid reason for building a sluice gate in the tunnel?

I am unsure what to do with these new and fascinating remains discovered in the Siloam Tunnel. Might there be an entirely different way to account for them? Very interestingly, mortar samples on the ceiling near the area of the supposed sluice gate contained charred wood that was dated to the Mamluk Period. The mortar also included traces of slag and metal (91-92, 109). Perhaps remains from this area, which shows such clear evidence of human alteration, was in some way related to this previously unknown evidence of smelting in the Mamluk Period.

Time and further research may help scholars better understand these obscure remains in the Siloam Tunnel. Even if unlikely, it was interesting to read yet another proposal related to this famed tunnel about which so much has already been written.

1. The article has received surprisingly little press so far. Another more summary appears here.
2. This is another discussion for another day, but I find the majority understanding (and in many ways, archaeological dogma) that Hezekiah undertook the Siloam Tunnel project as part of his preparations for Sennacherib's campaign in 701 BCE hard to accept. The hewing of the Siloam Tunnel through hard Mizzi Ahmar limestone not only would have taken years to complete, but in the end, it terminated in nearly the same place as Channel II after it was extended southward sometime in the 8th century BCE. A supposed rush job only to divert water to the same place it was already going makes little sense to me (replacing one channel that was falling into disrepair with another one seems like a better idea). Both channels have also been shown by recent excavations to be safely protected inside the 8th century BCE city walls (Reich and Shukron 2021:171-214). In brief, I believe there are other ways to understand both the archaeological remains and

biblical references to Hezekiah’s waterworks without folding the Siloam Tunnel into his preparations for the siege.

3. The authors appear to erroneously believe the Siloam Tunnel Inscription was written on a “tablet” that was inserted into a hole in the tunnel: “We hypothesise [sic] that this surface was being prepared to receive the emplacement of the well known Hezekiah’s tunnel inscription tablet...Should this indeed have been the objective it was obviously not carried out as the surface does not appear to have been completed and the inscription tablet was eventually inserted into the SE wall within a few meters of the tunnel’s southern exit. We point out that a similar preparation for the emplacement of a tablet was done near the junction of Channel IV and the Rock-cut Pool...” (94; emphasis mine)
4. The present cave where the spring emerges seems to have been hewn out in the 8th century BCE when the Siloam Tunnel was being excavated. Reich and Shukron assume that the level of Channel II is the same level that water would have emerged from the spring during the Middle Bronze Age (Reich and Shukron 2021:189, 212-213). However, Gill assumes the water was artificially raised to reach Channel II (1991:1467).
5. Because of lack of evidence, scholars now doubt the longstanding idea that Channel II had “windows” that were used for irrigation (as illustrated in this drawing). Reich and Shukron suggest there may have been a Middle Bronze Age pool in the Kidron Valley while noting that such evidence has not yet been uncovered.
6. So interpreted by Ronny Reich (2021).
7. They estimated around 250 cubic meters (= more than 550,000 lbs) of debris sat inside the rock cut area (Reich 2021:199).
8. Reich and Shukron 2021:336.
9. Gill 1991:1469.
10. Simons 1952:167-168.

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Please visit the site: <https://approachingjerusalem.substack.com/p/summary-and-analysis-new-article> [Go there for many pix and for embedded linx]

## **ARCHAEOLOGISTS UNEARTH ‘GREAT’ SASSANID FIRE TEMPLE IN NORTHEAST IRAN**

Archaeologists have unearthed the ruins of what they believe was one of the greatest fire temples in Iran during the Sassanid age.

“We have probably discovered the third greatest fire temple that existed in ancient Iran,” ILNA quoted archaeologist Meysam Labbaf-Khaniki as saying on Wednesday.

Labbaf-Khaniki leads the fifth season of an archaeological survey, which is currently underway in a valley near the village of Robat-e Sefid/Bazeh Hur, northeast Iran.

“During this archaeological season, we have gathered considerable evidence such as engraved plasterwork and inscriptions that suggest the ruins are related to an important fire temple.”

Inscriptions and their fragments that bear Pahlavi scripts should first be arranged and categorized till they could be read (and deciphered) by linguists and cultural heritage experts, he explained.

These fresh discoveries are expected to open a new chapter in the history of Iranian arts during the Sassanid epoch, the archaeologist said.

Exquisite stuccoworks embellish capital columns that support the main hall of the fire temple, he said.

Since 2014, Labbaf-Khaniki has taken part in previous excavations conducted at the ancient site. In 2018, a joint Franco-Iranian mission was tasked to study the whole valley, its human occupations, its geomorphology, and its implication in the large territory of Khorasan Razavi province.

The Sassanid age is of very high importance in the history of Iran. Under Sassanids, Persian architecture in addition to arts experienced a general renaissance. Architecture often took grandiose proportions such as palaces at Ctesiphon, Firuzabad, and Sarvestan which are amongst the highlights of the ensemble.

Sassanid archaeological designs typically represent a highly efficient system of land use and strategic utilization of natural topography in the creation of the earliest cultural centers of the Sassanid civilization.

In 2018, an ensemble of Sassanian historical cities in southern Iran, titled “Sassanid Archaeological Landscape of Fars Region”, was named a UNESCO site. The ensemble is comprised of eight archaeological sites situated in three geographical parts of Firuzabad, Bishapur, and Sarvestan.

The World Heritage reflects the optimized utilization of natural topography and bears witness to the influence of Achaemenid and Parthian cultural traditions and of Roman art, which later had a significant impact on the architecture and artistic styles of the Islamic era.

Aside from architecture, crafts such as metalwork and gem-engraving grew highly sophisticated, yet scholarship was encouraged by the state. In those years, works from both the East and West were translated into Pahlavi, the language of the Sassanians.

Please visit the site: <https://www.tehrantimes.com/news/474205/Archaeologists-unearth-great-Sassanid-fire-temple-in-northeast> [Go there for pix]

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## **GOVERNMENT TO FUND FURTHER STUDIES ON PUNIC WRECK OFF XLENDI**

The government has committed €140,000 through an agreement with the University of Malta for continued studies on an underwater Punic wreck off the coast of Xlendi.

The agreement was signed by Gozo Minister Clint Camilleri and university Rector Alfred Vella.

Camilleri said the discovery merits full attention as it can shed more light on how people back then lived, socialised and negotiated.

He said the government will continue financing this exploration exercise which is producing surprising results and will surely be of help to historians and academics. The wreck is also getting international attention, he added.

Camilleri said he hopes that the dream of eventually raising the wreck and putting it on exhibition comes true.

Professor Vella said it is an honour for the University of Malta to carry out this research. He hoped that more discoveries dating back to the Punic period will be made in the future.

The project, which spans over four years, will include research, conservation and documentation efforts on the wreck. The team is led by Professor Timmy Gambin.

**Please visit the site: <https://www.independent.com.mt/articles/2022-06-29/local-news/Government-to-fund-further-studies-on-Punic-wreck-off-Xlendi-6736244088>**

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## **‘OLDEST’ IRANIAN TOMBSTONE BEARING KUFIC SCRIPT GOES ON SHOW**

The oldest Iranian gravestone with inscriptions in the Kufic calligraphy has been put on show at the Archaeological Museum of Shahr-e Kord, the capital of Chaharmahal-Bakhtiari province.

Dating back to the early Islamic era, the gravestone was discovered in a holy shrine in Saman county, a local tourism chief has said.

The gravestone belonging to Harun Ibn Musa bears great significance in the history of Arabic script evolution in the area due to its antiquity and the simplicity of the writing, Ali-Asghar Noruzi explained on Sunday.

There are no older examples than this gravestone in any museums, collections, or published articles, the official added.

Other old gravestones discovered in historical sites are also being studied by cultural heritage experts, he noted.

Researchers are determining the material and spiritual value of gravestones after studying them scientifically, he mentioned.

“Studying the written information on these stones can be a guide for researchers who specialize in this area and can provide valuable information about the deceased person, the language of the time, and even the calligraphy and literature of the time.”

Studying all these inscriptions, stone inscriptions, and historical ruins of the region will result in documentation of the ancient history of the province, he concluded.

An off-the-beaten-path tourist destination, Chaharmahal-Bakhtiari, is the birthplace of various unique traditions and rituals relative to the 'tribal' lifestyles. Special forms of music, dance, and clothing are noteworthy. It has considerable potential to become a vibrant tourist attraction because of its changing natural landscape.

Please visit the site: <https://www.tehrantimes.com/news/474312/Oldest-Iranian-tombstone-bearing-Kufic-script-goes-on-show> [Go there for pix]

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## **STATEMENT ON THE STATE OF CONSERVATION WORK ON THE FLOOR OF THE BASILICA OF THE HOLY SEPULCHRE**

Presentation of the excavation work on the occasion of the visit of religious community leaders. Archaeological investigations are conducted by the team of the Department of Antiquities of the University of Rome La Sapienza

On the occasion of the visit of the leaders of the Communities to the archaeological site in the Holy Sepulcher complex, we presented the excavation works in progress. Archaeological investigations are conducted by the team of the Department of Antiquities of the University of Rome La Sapienza, under the direction of prof. Francesca Romana Stasolla, assisted by profs. Giorgia Maria Annoscia and Massimiliano David.

Following the restoration project of the floor of the religious complex, the excavation proceeds in successive areas to allow the regular performance of the liturgies by the various confessions and the normal flow of pilgrims. Starting from May 2022, we are carrying out archaeological investigations in the north nave of the basilica (the so-called Arches of the Virgin) and part of the north-western rotunda. The work is carried out in a continuous cycle, day and night, and the processing of the materials produced is carried out in real-time between Jerusalem and Rome, where the rest of the team works. The data processed during the excavation is entered in a database previously created ad hoc for the project and linked to the different historical and archive sources, thanks to the remote support in Rome.

The Drs. Beatrice Brancazi and Stefano De Togni, members of the University of Rome Sapienza team, presented the two excavation areas to the communities.

In the area of the north aisle, a very interesting stratigraphic sequence was identified, making it possible to trace the trenches dug by Father Virginio Corbo in the 1960s. It also allowed the acquisition of entirely new data. The most interesting are those relating to the construction site of the Constantinian age, pertaining to the construction of the religious complex within a quarry area. The rock layers of the quarry have been found. They have height differences caused by deep and uneven cuts, which also go down very deeply, as seen in other areas of the basilica. The operations of the Constantinian construction site had as their primary requirement that of bridging such unevenness of elevation to create a unitary and homogeneous plan to build the structures of the church and its annexes. It was done with progressive fillings, using layers of soil rich in the ceramic material to drain water and level the deeper areas. During the excavation, it was possible to analyze the methods of the foundation of the north perimeter wall of the Constantinian complex, still on the top.

Above these filling stratigraphies, the preparatory action for laying the flooring of the Constantinian tripartite, composed of large lithic slabs, was also identified. This floor has been the subject of voluntary stripping work throughout the area, except for the slabs corresponding to the stylobate. The spoliated area has been compensated by a layer of

earth showing intense traffic traces. Among the many materials found, the presence of mosaic tiles relating to floor pavements stands out.

The visit continued in the north-western area of the rotunda. Here the stratigraphy is much smaller due to the presence of the rocky bank at a much higher altitude. This factor and the continuous pavement renovation contributed to the constant removal and mixing of the underground layers. So the archaeological stratigraphy in the area is very small. Here the most interesting part is the one relating to the working phases of the rocky bank, which are being studied. In the central-northern portion of the area, close to the aedicule, a tunnel has been intercepted, partly already highlighted in previous searches, which descends vertically next to the aedicule for a depth of 2.80 m and then continues horizontally to the north. Its discovery in relation to the excavation stratigraphy and its connection with the entire water outflow system is an important aspect in the study of the architectural elements and will be analyzed within the project.

Prof. Francesca Romana Stasolla

Please visit the site: <https://custodia.org/en/news/statement-state-conservation-work-floor-basilica-holy-sepulchre> [Go there for pix]

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## **MYSTERIOUS DEITY FROM ANCIENT PALMYRA FINALLY IDENTIFIED, BY OWEN JARUS**

The god's name was never directly written out.

The identity of an unknown god described in inscriptions from the ancient city of Palmyra, located in modern-day Syria, has long baffled scientists. But now, a researcher declares that she has cracked the case.

Palmyra existed for millennia and the city flourished around 2,000 years ago as a center of trade that connected the Roman Empire with trade routes in Asia, such as the Silk Road.

The anonymous deity is mentioned in numerous Aramaic inscriptions at Palmyra and is referred to as "he whose name is blessed forever," "lord of the universe" and "merciful," according to Science in Poland (opens in new tab), a news site run by the Polish government and independent journalists. Many of these inscriptions date back around 2,000 years.

To solve this mystery, Aleksandra Kubiak-Schneider, a postdoctoral researcher at the University of Wrocław in Poland, compared the inscriptions from Palmyra to inscriptions found throughout Mesopotamia that date to the first millennium B.C. She discovered that the gods worshiped in Mesopotamia were referred to with similar names as the anonymous god from Palmyra. For example, "Bel-Marduk" — the supreme god of Babylon — was also referred to as "merciful." The phrase "lord of the world" — a title similar to "lord of the universe" was sometimes used to refer to Baalshamin, a sky god Kubiak-Schneider told Science in Poland.

Kubiak-Schneider told Science in Poland that the anonymous "god" mentioned in the Palmyra inscriptions is not a single god, but rather multiple deities that include Bel-Marduk and Baalshamin. She also contends that people did not mention the name of the deities as a sign of respect.

Additionally, when people wrote the inscriptions invoking divine intervention, they were not always reaching out to a specific god but rather any god that would listen to their prayers. "There was no one anonymous god, every god who listened and showed favor to requests deserved an eternal praise," Kubiak-Schneider said.

Live Science contacted scholars not involved with the research to get their viewpoints. The researchers that replied reacted with caution toward the proposal.

Kubiak-Schneider "presented [a] hypothesis to the scientific community which will discuss it and each scholar will decide to accept it or reject it presenting [their] counterarguments in the latter case," Leonardo Gregoratti, a researcher who has studied the history and archaeology of Palmyra and the surrounding region extensively, told Live Science in an email.

One researcher, who commented on condition that they not be named, agreed that the unnamed deity likely refers to multiple deities, but was concerned that some of the Babylonian texts that Kubiak-Schneider studied dated centuries earlier than the inscriptions from Palmyra.

Kubiak-Schneider did not return requests for comment at time of publication. Her results were published recently in the e-book (translated from French) "Dedications without theonym of Palmyra Blessed (be) his name for eternity(opens in new tab)" (Brill, 2021).

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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.

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Please visit the site: <https://www.livescience.com/ancient-palmyra-god-identified>  
[Go three for pix]



**MONUMENTAL SANDSTONE RELIEFS**  
**FROM THE NEOLITHIC: NEW INSIGHTS**  
**FROM THE CAMEL SITE IN SAUDI ARABIA,**  
**BY MARIA GUAGNIN, GUILLAUME**  
**CHARLOUX, AND ABDULLAH M.**  
**ALSHAREKH**

Today the austere deserts of Saudi Arabia evoke images of wandering nomads. But in late prehistory Saudi Arabia was surprisingly green and hospitable, the product of a humid period that lasted for at least four thousand years. One familiar figure, however, that unites the two scenes are camels.

The reliefs of the so-called Camel Site are located on a small cluster of three sandstone spurs, surrounded by fields and small farms on the outskirts of the modern city of Sakaka in al-Jawf Province in northern Saudi Arabia (Figure 1). The site was first recorded in 2016, after it was reported by Hussain Al-Khalifah, the former representative of the Jawf region for what is now the Heritage Commission of the Ministry of Culture. Since 2018 an international Saudi-French-German team has studied the site.

To establish the age of any engraved rock art is challenging. Unlike painted rock art, there is no organic pigment that could be radiocarbon dated. The dating of engraved rock art therefore requires more complex analyses of overlays – where they exist – of the relative differences in the amount of desert varnish that has accumulated on the rock surface over time, as well as of the context and content of the images.

Events such as the introduction of domesticated livestock can be dated in the archaeological record, and the depiction of livestock species must therefore post-date rock art depictions. These correlations can then be used to anchor the relative sequence visible in superimpositions. Comparisons of rock art depictions with similar content or stylistic traits are therefore important. But because the reliefs at the camel site are unique (Figure 2), and only found at one site, the process of establishing an approximate age for the engravings had to start from scratch. In a first assessment of the site, the camel reliefs were compared to the only other known life-sized camel representations, which are found in the Siq in Petra and are of Nabataean age. However, detailed analysis of the carved reliefs and the wider context of the Camel Site led us to revise this initial age estimate.

The reliefs are extremely eroded, and none of the carvings have survived intact. The formation of rock varnish has led to case hardening, which has toughened the outer layer of the rock. However, once erosion penetrates this outer shell, fragments of the reliefs are quickly lost. In addition, hollowing out of the supporting sandstone blocks has caused several panels to fall. Nevertheless, in some areas the surface of the original relief has been preserved and toolmarks remain visible.

Analysis of these toolmarks revealed that the reliefs were likely carved using stone tools – for us a first indication that the reliefs may be older than initially thought. Where the

rock varnish is preserved, a portable XRF device was used to measure the density of the main elements making up the varnish – specifically manganese and iron. Results suggest that the varnish on Panel 1 is close to maximum density, a process that is known to have taken up to 8000 years. These findings were further supported by the fact that a detailed survey of the site revealed finds of Neolithic and Middle Palaeolithic stone tools, but no later material culture such as pottery. We also found a number of stone tools, with traces consistent of having been used to carve sandstone. Finally, excavation of a test trench at the base of one of the rock spurs revealed Neolithic stone tools and arrowheads, a small number of beads and rich faunal remains which could be radiocarbon dated to around 5300 BCE.

The combined evidence thus suggests that the site was in use in the late 6th millennium BCE, although it remains unclear how much earlier or later the reliefs were carved. Differences between individual animal reliefs, and the presence of grooves and alterations suggest that the site and its reliefs were carved and re-carved over a prolonged period, perhaps centuries or even millennia. Optically Stimulated Luminescence dating of the sediment beneath one of the fallen fragments – a method that calculates when sand was last exposed to sunlight – also revealed that the fragments fell at least 3000 years ago, and that erosion of the reliefs must have already been at an advanced stage.

The carved reliefs at the Camel Site are unique – not only for the rock art of Arabia, but across the world. Carving of reliefs of this size would have required extraordinary technological skill. Carvers had to work at height. While remains of small working platforms are visible at two of the panels, most would have been carved either using simple ladders or some sort of scaffolding or rigging. While working on any body part carvers were also unable to see the whole sculpture, making it all the more astonishing that the reliefs are completely naturalistic and in proportion.

Where the original rock surface is preserved, the carvings show an extraordinary level of detail; lips, eyes and even the ligaments beneath the skin were depicted. Reliefs were likely carved by teams, with one person working on removing the bulk of the rock to reveal the shape of the body – particularly below the abdomen and between the legs many of the reliefs required the removal of substantial amounts of rock (see for example Figure 2 and Figure 8). Working practises of modern stonemasons suggest that the finer work of carving the surface and polishing it was likely carried out by a different, more experienced person. High-reliefs would have taken up to two weeks to carve, and involved a whole team working to procure the raw material for the stone tools, shaping the stone tools, and then frequently re-sharpening them, building rigging, and bringing water and food. The investment of time and effort and the level of planning that would have been involved clearly sets the Camel Site apart from conventional, two-dimensional rock art sites in the region, which would have been produced over a much shorter time span.

Engravings, rather than reliefs, of large, naturalistic camels are also known from other sites in northern Arabia, in the region near the Camel Site, as well as from sites south and west of the Nefud desert.

In some cases, these carvings have part of the body carved in low relief. It therefore appears that the Camel Site is a three-dimensional, monumental expression of a more widespread tradition of camel representations. As two-dimensional carvings tend to be

better preserved, this provides further insights into the reliefs at the Camel Site. In most cases camels are clearly depicted with a bulging neck, a sign of a male camel in rut.

In feral camels the mating season coincides with the end of the wet season, when vegetation is most abundant. The fact that all camel representations show animals that are clearly well fed appears to support this seasonal correlation. At the Camel Site, the neck is only preserved in two of the camel carvings, and in both cases the bulging neckline is clearly visible (Figure 5 and Figure 6). It is therefore possible that the reliefs are part of a symbolism that references either the mating season, or the end of the wet season.

The reliefs at the Camel Site thus provide unique insights into the yearly rhythm of the seasons and their symbolism for Neolithic populations, who appear to have come together at this location to make reliefs, to modify older reliefs, and to mark reliefs with grooves, repeatedly and over many generations.

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Please visit the site: <https://www.asor.org/aneoday/2022/07/camel-site-saudi-arabia>  
[Go there for pix, caps, and format]

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## **2,000-YEAR-OLD ANCIENT EGYPTIAN MUMMY LIKELY HAD CANCER - STUDY**

Cancer cells found in remains of the mummy can advance modern medicine, Polish researchers say

An analysis of the remains of a 2,000-year-old Egyptian mummy found that she may have suffered from nasopharyngeal cancer, a Polish study published on Thursday has revealed.

The mummy skeleton, kept at the National Museum in Poland's capital Warsaw, was analyzed by an interdisciplinary group of researchers from the University of Warsaw.

Their findings were published in Science in Poland, a website operated by the Polish Press Agency dedicated to reporting scientific discoveries made in Poland.

The study was carried out as part of the Warsaw Mummy Project, in which paleontologists, archaeologists and bio-archaeologists joined forces to uncover more details through a thorough examination of human and animal mummies from ancient Egypt.

The woman is believed to have died at a relatively young age.

Prof. Rafał Stec, from the university's Department of Oncology, estimated a high probability of the woman dying from cancer due to her young age and the lack of other potential causes of death found.

"Firstly, we have unusual changes in the nasopharyngeal bones," which is not typically found in bodies that went through the mummification process, Stec explained. "Secondly, the opinions of radiologists based on computed tomography indicate the possibility of tumor changes in the bones."

According to the researchers, the finding of cancerous cells in remains from ancient Egypt is common, with several known, confirmed cases of nasopharyngeal cancer in the archaeological record.

The mummy is suspected to have had a malignant tumor, although researchers cannot determine that with 100% certainty, Stec admitted, adding that a definitive diagnosis is only possible after a histopathological examination is conducted.

Ancient mummy can advance modern medicine Analyzing the mummy's illness can significantly contribute to modern medicine, the researchers noted.

By uncovering the molecular signature of the cancer, the research team can compare it to modern-day cancers to examine and expand on cancer evolution studies. The research can potentially aid in making a breakthrough in the diagnostics and treatment of cancer.

Further research planned by the team will see them collect tissue samples from the mummy to compare with cancer samples found in other Egyptian mummies examined in the US and the UK.

This will help researchers determine the cause of the cancer, whether by virus infection or genetic background. The results of the research are expected to be released by the end of the year, the study noted.

The mummy, brought to Poland in the 19th century, has belonged to the University of Warsaw since 1917 and is displayed in the national museum's ancient art gallery. In 2021, prior research done on the mummy concluded that the woman was pregnant.

**Please visit the site: <https://www.jpost.com/archaeology/article-711600> [Go there for pix]**

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## **HIDDEN ANCIENT ROMAN 'BRIDGE OF NERO' EMERGES FROM THE TIBER DURING SEVERE DROUGHT, BY OWEN JARUS**

A severe drought in Italy has revealed an archaeological treasure in Rome: a bridge reportedly built by the Roman emperor Nero that is usually submerged under the waters of the Tiber River.

Emperor Nero, who ruled as the Roman Empire's fifth emperor from A.D. 54 to 68, was a controversial sovereign who built public structures and won military victories abroad, but also neglected politics and instead focused much of his time and passion on the arts, music and chariot races. Rome's coffers were also drained during his rule, partly as a result of building the "Domus Aurea" (the Golden Palace), which Nero built in the center of Rome after the great fire. During his reign, he killed his mother and at least one of his wives, and he struggled to rebuild Rome after a huge fire ravaged the city in A.D. 64. Nero killed himself in A.D. 68 at the age of 30 after being declared a public enemy by the Roman senate.

Live Science talked to several experts, who noted that the remains of this bridge have become visible in the past due to low water levels. They also note that, despite its name, it's not certain if this bridge was built by Nero.

"The remains of this Roman bridge are visible whenever the water level of the Tiber falls, therefore whenever there are lengthy periods — like now — of very low rainfall," Robert Coates-Stephens, an archaeologist at the British School at Rome, told Live Science in an email.

Multiple sources told Live Science that the bridge was possibly built before Nero's rule. "The origins of the bridge are uncertain, given that it is likely a bridge existed here before Nero's reign and therefore the Pons Neronianus was probably a reconstruction of an earlier crossing," Nicholas Temple, professor of architectural history at London Metropolitan University, told Live Science in an email.

The name Pons Neronianus "appears for the first time only in the 12th-century catalogues of Rome's monuments," Coates-Stephens said.

"It's true that Nero had extensive gardens and properties in the area of the Vatican, and so a bridge at this point would have given easy access to these."

### **Bad place to build?**

A number of scholars told Live Science that the bridge was constructed on a poorly chosen site.

The bridge "was built on a tight bend in a floodplain," which is "a terrible idea," Rabun Taylor, a classics professor at University of Texas at Austin, told Live Science in an email. "River bends cutting through pure sediment tend to wander and change shape, so

their banks are prone to losing contact with bridge abutments" that connect the bridge to the ground, Taylor said.

He noted that "that's probably what happened to Nero's bridge — and it may well have happened by the mid-200s A.D., less than two centuries after Nero's death." Taylor's research into the bridge's history "suggests the bridge was dismantled at about that time, and the stone piers were reassembled to create a new bridge in a more stable area downstream.

The Pons Neronianus connected Rome to an area that didn't have a lot of development at the time. While one side of the river had the Campus Martius, a drained wetland that at this point in time had some public buildings (such as baths and temples), and was used to organize military parades, the other side connected to an area where the Vatican is now that had some large houses. "It was always good to connect the two banks of the Tiber," but "the Vatican area was mostly private estates until the Fire of 64," Mary Boatwright, a professor emerita of classical studies at Duke University, told Live Science in an email. Boatwright noted that it wasn't until the 130s A.D. that development picked up in the area.

The bridge did, however, have some military and religious importance for Rome, Temple argued. "The Pons Neronianus was both strategically and symbolically important," Temple told Live Science. One side of the bridge was located near an area where Roman troops would assemble to march in a triumph (a politically and religiously significant victory parade) and was likely part of the parade route. "The precise route of this procession is uncertain but it seems probable that the Pons Neronianus [and any bridge that preceded it] served as the bridge crossing for this purpose," Temple said.

This bridge may also have been used to transport high-profile prisoners, Temple added, noting that the crossing may have been "used by St. Peter when he was taken in chains" after his trial to the Vaticanus, where he was crucified in around A.D. 64, Temple said.

"The Pons Neronianus has potentially a double significance, as the crossing point into Rome of triumphal armies, and in the opposite direction for St. Peter's journey to the site of crucifixion," Temple said.

Depending on how climate change affects the Tiber's water levels, it's possible that the remains of the bridge may become visible more often. It probably will be visible more often, Boatwright said, adding that "I'd personally rather it be submerged, and Italy not be threatened with drought."

**Please visit the site: <https://www.livescience.com/drought-reveals-roman-emperor-nero-bridge> [Go there for pix]**

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## **HOW BAGHDAD’S BACKYARDS ARE BRINGING BACK IRAQI DATES - A COMPANY IS USING GARDEN TREES TO REVIVE AN ANCIENT INDUSTRY, BY CHARLIE METCALFE**

FAIZ AND NIDHAL NAJIMALDEEN STAND in the shade of a 40-foot palm tree at the end of their garden in central Baghdad. The brother and sister, who have lived here since the 1980s, watch as, high above, Adil Yassin Hubair encloses great green bunches of dates into netted bags. It’s June, and the unripe fruit needs protection from marauding birds.

Hubair, 29, works for a young Iraqi company called Nakhla, or “palm tree” in Arabic, which is trying to revive Iraq’s once-great date empire. Nakhla’s model offers palm-tree owners, farms, and other organizations its palm-care services in return for an annual subscription fee of between \$35 and \$75 USD per plant. Nakhla then harvests and sells the dates, returning a percentage of the profit to the palm owners.

Iraq once produced most of the world’s dates. But an eight-year war with Iran in the 1980s and the US-led invasion in 2003 led to the destruction of as many as half of its 30 million date palms. Once known as the “King of Dates,” Iraq only holds a five percent share of the world’s date market today

Faiz Najimaldeen walks me across a trim lawn towards two more palms growing beside the house. The garden used to have another two palm trees, Najimaldeen says. One died from a lack of care. The other was hit by a bullet fired by US forces in 2003. “It went straight into the heart of the tree,” he says, pointing up to an array of pockmarks that cover the back wall of the house.

The Najimaldeens earn about 225,000 Iraqi Dinars (\$154 USD) per year from their dates. But the collapse of Iraq’s date empire meant more than the loss of income. The date palm that now grows around the world, including in California, may have originated in Iraq. They’re mentioned in the Quran 22 times and, in one chapter recounting the story of Jesus’s birth, God tells Mary to eat their fruit as she suffers the pain of labor. Even the Babylonian king Hammurabi, who ruled over what is now Iraq more than 3,500 years ago, included several laws relating to the treatment of date palms in his legal code.

The Najimaldeens tell me of the date’s many health benefits. They’re high in antioxidants that help prevent disease. They’re also high in fiber, potassium, magnesium, copper, manganese, and vitamin B6. The Quranic story about their power to ease the contraction pains of pregnant women isn’t without scientific grounding either. Dates are believed to promote natural labor. “There is nothing better than this tree,” Najimaldeen says.

The economic, cultural, and health benefits were all on Labeeb Kashif Al-Gitta’s mind when he and his co-founders founded Nakhla in 2016.

They recognized that, despite Iraq’s heritage, no one was looking after its remaining date palms. The traditional harvesting model also seemed broken. Most palm climbers in Iraq work freelance. According to Al-Gitta, this creates problems. “They go to farms, but they do sloppy work,” he says. “They just want to finish as quickly as possible and get paid. They don’t care what happens to the trees.”

A TV program about an “adopt a bee” project in the United Arab Emirates provided the inspirational spark for Al-Gitta and his co-founders. Their initial concept was quite different from Nakhla today, and involved buying a farm, growing palm trees, and inviting sponsors to pay for the trees’ upkeep as a way to improve the environment. The dates could then be sold for profit.

Al-Gitta and his colleagues took the idea to a UN development initiative in Baghdad. To their disappointment, the initiative’s managers told them the idea would fail. They would have to wait years for the trees to grow, and sponsors would have little reason to pay for them in the meantime. Al-Gitta and his co-founders would have to return to the drawing board.

Despite the setback, Al-Gitta knew they had been onto something. “I had an itch in my brain,” he says. “Then I got something.”

Walking along Baghdad’s streets, Al-Gitta noticed palms poking their fronded heads above residential garden walls. He had palms in his own garden, and understood the frustrations of dealing with freelance tree climbers. Many owners didn’t bother to care for their palms at all, which meant the trees never bore fruit. That’s when he came up with the idea for Nakhla’s current subscription-based model.

The pivot meant that there was no need to wait for new trees to grow before turning a profit. But it wasn’t without its challenges. “It’s not easy to convince people of a new idea here in Iraq,” he says.

“Because we have come out of a lot of wars, people can’t trust people who come to their homes. They don’t know you.”

By 2018, the Nakhla founders had 20 trees in their care. From there, the quality of their service spread by word of mouth. They visited the palm trees four times per year, unlike the single visit solo freelancers would make. They also made sure to clean up any mess left behind.

Nakhla is now responsible for around 14,000 trees in the capital. Next year, Al-Gitta hopes to make that 50,000. Nakhla has grown beyond residential garden walls by taking over the care of palms on bigger farms too. Farmers only need to pay the first year’s subscription fee. Date sales cover the cost of the palm-care service thereafter.

Al-Gitta even managed to revive the original “Adopt a Palm” initiative, with cooperation from the Iraqi government. Sponsoring companies can now receive tax credits for funding the upkeep of palms lining Baghdad’s public streets. Branded signs are erected beside the adopted trees like miniature billboards.

Such rapid expansion has presented new challenges. Al-Gitta is struggling to hire enough tree climbers to service all the trees under Nakhla's care. The trade takes at least five years to learn and the conditions are dangerous. Many who might once have inherited the jobs from their fathers are finding other work. Now, Al-Gitta is considering using cranes to lift non-specialist workers up to the dates instead.

There are also challenges posed by the date market itself. After the Iraqi industry collapsed, other countries like Egypt and Iran were able to inherit its customers by selling much cheaper alternatives. But Al-Gitta hopes that Iraqis will be willing to pay the difference when presented with Iraqi dates in high-quality packaging. "Iraqi people love Iraqi dates," he says. "They choose Iraqi dates over any other, every single time."

Nakhla is now making plans to expand outside Baghdad, to other cities like Mosul in the north. It's even received a request to set up a program in Egypt. Al-Gitta envisions a future where people across the world can adopt Iraqi trees by paying subscription fees and receiving profits in return, all while helping restore Iraq to its throne as the King of Dates.

Back in the Najimaldeen's garden, Nidhal brings out a rectangular cardboard box of Nakhla dates, cold from the fridge. These ones are stuffed with little golden walnuts. She prompts me to take them.

Meanwhile, Faiz asks me to guess how old he is. Early 70s, I say. "I'm 84," he says with pride, before extolling the dates' health benefits. "We eat them every day," he says. "Of course we do."

**Please visit the site: <https://www.atlasobscura.com/articles/dates-in-iraq> [Go there for pix]**

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## **ETHNOARCHAEOLOGY IN CYPRUS,** **BY GLORIA LONDON**

Not all archaeologists excavate dead and buried artifacts. Those of us who work among the living are called ethno-archaeologists. We observe people currently carrying out any activity that was done in antiquity, such as knapping razor-sharp stone tools, fermenting food in clay jars, building homes from sun-dried bricks, and more. My focus is pottery making.

Clay pots were the most common container for 10,000 years. They protect their contents better than baskets and wood, that are not airtight, and stone containers that are heavy and cumbersome. However, there is a downside with pottery – it breaks and cracks easily.

Traditional pottery includes anything produced in a pre-modern technology during the past several hundred years. To this day there are only few ways to make pottery. Other than the most recent advances, the techniques of manufacture have changed little over the millennia. Given that traditional potters today coil-build vessels from local clays, they face many of the challenges that confronted their ancient counterparts.

For example, combed, incised, or burnished patterns, rather than paint, persisted on red wares throughout the Bronze and Iron Ages. The ancient patterns are identical to those on pots made in a handful of villages on the island of Cyprus to this day. Coincidence? Continuity?

Neither. It is the nature of rocks, clay, and fire. And it is a process that has been handed down from generation to generation.

Salts and tiny rocks endemic to many red clay deposits of the eastern Mediterranean created highly durable and transport-worthy containers.

Often, their surfaces were unable to absorb paint due to the abundant, nearly invisible rocks that form the infrastructure of the pot wall.

The rocks, unlike the clay, do not absorb paint.

In addition, as pots dried, salts in the clay migrated to the surface and created an impenetrable layer that resisted paint adherence. Even if the uppermost layer of clay containing most of the salt deposit was removed prior to painting, the remaining salt masked the paint and resulted in faded hues when fired. Instead of paint, the easiest decoration involved cutting into the clay, or rubbing to burnish the surface, rather than painting it. Ancient craftspeople encountered the problem of painting that they repeatedly solved with incised design motifs.

Painted pottery, especially light-colored wares made in the Aegean and eastern Mediterranean, found customers from ancient Egypt to Syria, wherever the local pots had plain red surfaces.

Today, rural women in Cyprus still shape traditional red wares by hand for six months a year. They use the coiling technique, i.e., rolling a coil of clay between their hands, before adding it to build cooking pots, jugs, jars, ovens, juglets, beehives, goat-milking pots, and incense burners.

The coiling technique is a method of manufacture used since the Neolithic Era for vessels of all sizes and shapes. Coils can be long or short, wide or narrow, and applied to pots standing on a turntable or on the ground. Until recently, the rural Cypriots, like their ancient brothers and sisters, fired their finished pieces in wood-burning kilns made of stone.

In 1986 I began a long-term ethno-archaeological study of female potters in Cyprus to record the industry. While living full-time in two different villages for six months, I continuously observed potters at work. At sunrise I awoke to the sound of people pounding clay. At 5:00 AM I saw kilns stacked with raw pots. Shortly afterwards, the potter or her husband ignited a small fire outside the kiln – not in the firebox. The initial flame dried the kiln, pots, and wood. After several hours, the fire was pushed into the firebox and fed with branches. Large logs, added around 7:00 PM, created a roaring fire for two hours. The kiln firing lasted 13-14 hours. The sizzling hot pots were unloaded early the next morning.

I rarely asked questions or offered comments. My inability to speak Greek made it effortless to remain silent and allow the work to proceed largely uninterrupted. I recorded, photographed, and filmed the women with their permission. While professional ethics at the time stipulated that, as researchers, we do not mention people by name, the women I observed entreated me to preserve their names for posterity.

It disturbed me that I was not able to give them the acknowledgement they deserved. In 2008, with changes in the prevailing attitudes within the scientific community, I began to reveal their names.

It was uncomfortable to watch, without offering my assistance, as the women crushed the clay and carried heavy pots. All shapes started from a cylindrical piece of clay positioned on a piece of bark or wood placed on a turntable. Women shaped jugs, cooking pots, and all small shapes while seated. After forming the body, each piece dried slightly on the ground before it was ready for the next stage of work on the turntable. Jars and ovens were too heavy to place back on the turntable.

Instead, women bent over while walking backwards around each pot to add coils. Their vertebrae cracked one after another as they unfolded their bodies to stand up after walking around one oven or jar after another to add coil after coil.

Potters seemed uneasy with my stopwatch and my counting the rare blemished piece (2% observed in 40 firings) pulled from the kiln. My infrequent interviews conducted through interpreters investigated family histories, pot usage, cleaning, and former methods of distribution by donkeys and carts.

Cypriot urbanites recall drinking cool, sweet water poured from red clay jugs at their grandparents' village. With great nostalgia, they describe luscious, slow-cooked meals

prepared in clay cookware. They ask me if the village food and water could have tasted so much different and better than meals in the cities. Or was it their imagination?

Happily, I can report that their joyful reminiscences are not idealized versions of the recent past. Their experiences and recollections are authentic. Thirst-quenching water, naturally cooled to the perfect temperature, flowed from the jugs that villagers lugged home from the spring. As improbable as it might seem, handmade water jugs sweeten, cool, and improve water quality without chemicals or an artificial filtration system. The unique properties of unglazed red wares purified the water thanks to their ability to leak or “sweat” their contents. While wheel-thrown white wares made in Cyprus leaked a modest amount, it was not enough to impact the taste or temperature of the water. Foreign visitors in the 19th century advised about the need to place jugs in a deep bowl overnight due to the leakage. It is likely that the need for sweaty pots guaranteed their continued manufacture alongside light-colored plain or painted versions since earliest times. Potters, past and present, used whatever clay was available, but red clay jugs always performed best for water. The less porous white jugs accommodated honey, wine, or other fluids.

Before modern refrigerators, yogurt machines, ovens, and washing machines, women shaped these same devices from clay. Ceramics proved to be essential for daily rural life. Well into the mid-20th century, with bare hands, the potters produced the basic containers for collecting, processing, preserving, cooking, and storing foods. Women, men, and children mined clay from nearby slopes or fields. Their customers were largely Cypriots. Tourists had little interest in the thick-walled cookware, beehives, ovens, jugs, milking pots, or even the small and friable decorated juglets.

Thirty years after my initial visit, residents of Agios Demetrios (Marathasa) in the Troodos Mountains, have conscientiously assembled pots, and the tools to make them, with the intention of establishing a permanent collection in the village. This year, Kornos village holds its first local pottery event.

The purpose of ethno-archaeological research is to observe and record current practices to better recognize and explain the diversity that archaeologists have detected for ancient material culture. My weariness with the conventional use of pottery for chronological purposes and attributing morphological nuances to different time periods rather than human nature led me to find my own way to study ancient pottery.

Although most people assume that ancient women did not function as craft specialists, capable of producing thousands of highly standardized containers by hand, the Cypriot case study proves otherwise. Female potters who worked as itinerants contradict the notion that travelling potters were always men. Women relocated their nuclear family from the hot humid lowlands to the foothills for two months each summer. Young people would collect clay and fuel. After crushing the clay clods under foot, children trampled the clay powder with water in preparation for use. More than one young person married a local in a foothills village started their own pottery workshop that lasted for one generation only. Their children, who did not grow up in a milieu of potters, chose other work.

Ancient handmade ceramics were associated with cooking, processing, preserving, and stockpiling foods. Current traditional craft specialists provide a constructive resource to

create valid templates for how their ancient counterparts may have functioned. My decades of work with excavated sherds led me to approach the traditional potters with specific concerns raised by archaeologists. These include how to recognize production locations, why they evade detection, and what accounts for the dearth of waster piles; how pots are used and how long they last; how to reuse sherds; how the craft was transmitted; why some containers have a maker's mark; how to differentiate household wares made in two contemporaneous communities; and how to consider the behavioral sources of variation in shapes and surface treatments.

To excavate an ancient site and find broken artifacts, untouched by anyone for thousands of years, is exhilarating. But, to work with whole pots as they are made, fired, used, and reused until they become small unrecognizable pieces that blend into their surroundings, is even more exciting. Recording a part of our cultural heritage before it disappears has been my passion.

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Gloria London is Scientific Advisor, Agios Demetrios (Marathasa) Heritage Collection.

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Please visit the site: <https://www.asor.org/onetoday/2022/07/ethnoarchaeology-cyprus>

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## **MYCENAEAN-LIKE DAGGER-SWORD AND UNIQUE SEAL DISCOVERED AT ANATOLIAN MOUND, BY SAHIR PANDEY**

Kutahya in Western Anatolia is home to one of the world's oldest settlements, which began 8,100 years ago. At this very site, during the excavations of Tavşanlı Höyük or the Tavşanlı Mound, a 3,300-year-old seal and a dagger-sword that resembles Mycenaean weaponry were unearthed. Tavşanlı Höyük was once the capital of an unknown kingdom of over 50 hectares, serving as a crucial inter-linking route between Central and Western Anatolia, reports Ahaber.

It is often called the 'Heart of Western Anatolia' for its resemblance to a heart in aerial shots and is one of the largest Bronze Age mounds. Excavations commenced here almost exactly a year ago, under the aegis of Dr. Erkan Fidan, Associate Professor at the Archaeology Department of Bilecik Şeyh Edebali University, and the Turkish Ministry of Culture and Tourism.

Governor Ali Çelik has estimated that these excavations will continue for at least 3 decades, with initial fund allocation planned along those lines. In total, a team of 25, local and foreign experts, have been working on this site, under Associate Professor Dr. Fidan's leadership. For the most recent find, a post has been shared on the social media of the Department of Excavations and Research.

"Age analysis by TÜBİTAK reveals that Tavşanlı Höyük is the oldest known settlement of Kütahya. The village, which developed over time, became a big city five thousand years ago. In this period, which is called the Bronze Age, it is thought that copper and silver were processed and traded here," provided Dr. Fidan.

The research and study that is going to be carried out here are important for understanding how interregional communication was shaped in ancient Anatolia. 25 local and foreign experts are involved in the research, and over the last week, a team of 6 amateurs were taken on to help them understand the process of archaeology. This included university students, graphic artists, art teachers, housewives, and even a private sector employee. This 4-day workshop, under the banner of the archaeology club, was an opportunity for history buffs to have a 'real archaeological excavation experience', including working with Hittite cuneiform, Gordion mosaics that dated back to 750 BC, amongst others.

Urbanization, Development, and the Luwians The settlement started to urbanize some 5,000-years-ago and would go onto become a 'big city' a thousand years later, existing contemporaneously with the last periods of the Hittites. This has been seen for the first time in a few archaeological centers in Western Anatolia, changing the way we understand this crucial historical region, reports Arkeoloji Khaber .

"It is known that the peoples defined as Hatti in Central Anatolia and Luwi in Western Anatolia lived in this period. I can say that the Hittite civilization in Hatti and later is well known, but we do not have any information about the Luwian cities. I think that

Tavşanlı Höyük may be a city belonging to the Luwians, which is seen as a missing link in Anatolian history,” he said.

The Luwians were a group of Anatolian people – they lived in central, western, and southern Anatolia (present-day Turkey), during the Bronze and Iron Age. Their language, Luwian, was interestingly sometimes used by the Hittites, which made them linguistically related cousins, who shared a unique hieroglyphic script. Luwian was an Indo-European language written in Mesopotamian and Akkadian cuneiform.

In many contemporaneous documents from the era (particularly from the Hittite capital of Hattusa), it appears that Western Asia minor is called Luwiya. It is the boon of this language, Luwiya, that we have so much information in the first place about Luwian culture. It was not just an ethnic identity, but existed as a separate linguistic identity as well, one of Asia’s first fully formed script-based ones.

The current excavations and research help trace Luwian history and shed light on the cultural practices that allowed distinctions to exist between Central and Western Asian kingdoms of the time, which were severely fragmented.

**Please visit the site: <https://www.ancient-origins.net/news-history-archaeology/mycenaean-dagger-sword-0017034> [Go there for pix]**

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## **HIPPOCRATES’ MEDICAL RECIPES** **DISCOVERED AT MONASTERY IN EGYPT,** **BY KERRY KOLASA-SIKIARIDI**

The oldest-to-date medical recipes from Hippocrates were recently discovered by monks at the St. Catherine’s Monastery in South Sinai, Egypt.

The discovery of the 6th century AD manuscript, which contains many medical recipes written by the ancient physician, occurred amidst restorations at the monastery’s library.

The manuscript, which was written by an anonymous scribe, also contains other medical recipes as well as illustrations of medicinal herbs.

Hippocrates’ medical recipes were found at the famed monastery on Mt. Sinai

The library at the monastery, which is considered to be the oldest continuously operating library in the world, contains some six thousand manuscripts written in Arabic, Ethiopian, Coptic, Armenian, Syriac, and Greek.

The oldest manuscript at the library, which mainly houses works of history and philosophy, is thought to date back to the 4th century AD.

Along with the text from Hippocrates, a manuscript featuring biblical passages was also found during restoration efforts at the monastery.

In total, this discovery revealed a medical recipe attributed to Hippocrates, as well as three recipes with pictures of herbs. The manuscripts were then examined by researchers at the Early Manuscripts Electronic Library (EMEL).

“The manuscript, which contains three medical texts, will be enlisted among the oldest and the most important manuscripts in the world,” Michael Phelps, a researcher at the EMEL recently told Asharq Al-Aswat.

Hippocrates, the father of medicine

Born on The island of Kos, c. 460 BC, the Greek physician Hippocrates is considered the father of medicine, as he was the first known physician who believed that diseases were caused by some type of natural action instead of being instigated by the spirits or gods.

In addition to recognizing that disease is not caused by supernatural forces, Hippocrates invented clinical medicine and what we know today as the doctor-patient relationship.

Perhaps most amazingly of all, he was the first known physician to recognize that thoughts and emotions arise in the brain rather than in the heart.

Hippocrates was also the medical practitioner who created an oath of conduct for physicians which has remained influential for 2,500 years.

Hippocrates was the first physician to name cancer (“karkinos,” Greek for crab). The word came from the appearance of the cut surface of a solid malignant tumor with the veins stretched out on all sides much like a crab’s claws.

Hippocrates’ conception of cancer centered around the “humoral” theory, as he believed that the body contained four humors (body fluids), namely blood, phlegm, yellow bile, and black bile.

Any imbalance of these fluids would result in disease, and an excess of black bile in a particular organ site was thought to cause cancer.

The ancient Greek physician believed that diet is important in a person’s life and that a good diet could keep them healthy.

He also believed that a proper diet could have healing qualities for certain ailments. He placed great importance on what a patient ate or what foods to avoid. He often relied on lifestyle modifications, such as diet and exercise, to treat diseases, including diabetes.

Please visit the site: <https://greekreporter.com/2022/07/21/medical-recipe-hippocrates-st-catherine-monastery-egypt/>

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## **SCIENTISTS FINALLY DISCOVER WHAT CAUSED THE COLLAPSE OF THIS ANCIENT KINGDOM, BY UNIVERSITY OF BASEL**

For over 400 years, the Himyarites held control over much of southern Arabia. Droughts in the sixth century helped Islam gain ground

Extreme dryness aided the collapse of the ancient South Arabian kingdom of Himyar. The journal Science has recently published these discoveries by researchers from the University of Basel. The droughts left an area in disarray and, when coupled with political unrest and war, helped to create the circumstances necessary for the spread of the newly formed religion of Islam on the Arabian peninsula.

There are still traces of the Himyarite Kingdom on the plateaus of Yemen. Terraced fields and dams were a part of an extremely complex irrigation system that turned the semi-desert into fertile farmland.

For many years, Himyar was a well-established region in South Arabia.

However, despite its prior might, the kingdom had a crisis in the sixth century CE, which resulted in its defeat by the nearby kingdom of Aksum (now Ethiopia). Extreme drought, a previously unrecognized factor, may have played a significant role in the upheavals in ancient Arabia that led to the rise of Islam in the seventh century.

Researchers under the direction of Professor Dominik Fleitmann recently released their findings.

Petrified water acts as a climate record The layers of a stalagmite from the Al Hoota Cave in Oman were examined by Fleitmann's team. The amount of precipitation that falls above the cave has a direct correlation with the stalagmite's development rate and the chemical makeup of its layers. As a consequence, the stalagmite's shape and isotopic composition of its deposited layers serve as an important archive of past climate.

“Even with the naked eye you can see from the stalagmite that there must have been a very dry period lasting several decades,” says Fleitmann. When less water drips onto the stalagmite, less of it runs down the sides. The stone grows with a smaller diameter than in years with a higher drip-rate.

The stalagmite layers' isotopic analysis enables scientists to estimate the yearly rainfall levels. For instance, they found that there must have been a severe drought in addition to the fact that less rain fell over a longer period of time. The researchers were able to date the dry era to the early sixth century CE using the radioactive decay of uranium, however only to within 30 years.

Detective work in the case of Himyar's demise “Whether there was a direct temporal correlation between this drought and the decline of the Himyarite Kingdom, or whether it actually didn't begin until afterward – that was not possible to determine conclusively

from this data alone,” explains Fleitmann. He, therefore, analyzed further climate reconstructions from the region and combed through historical sources, collaborating with historians to narrow down the time of the extreme drought, which lasted several years.

“It was a bit like a murder case: we have a dead kingdom and are looking for the culprit. Step by step, the evidence brought us closer to the answer,” says the researcher. Helpful sources included, for example, data about the water level of the Dead Sea and historical documents describing a drought of several years in the region and dating to 520 CE, which do indeed connect the extreme drought with the crisis in the Himyarite Kingdom.

“Water is absolutely the most important resource. It is clear that a decrease in rainfall and especially several years of extreme drought could destabilize a vulnerable semi-desert kingdom,” says Fleitmann.

Furthermore, the irrigation systems required constant maintenance and repairs, which could only be achieved with tens of thousands of well-organized workers. The population of Himyar, stricken by water scarcity, was presumably no longer able to ensure this laborious maintenance, aggravating the situation further.

Political unrest in its own territory and a war between its northern neighbors, the Byzantine and Sasanian Empires, spilling over into Himyar, further weakened the kingdom. When its western neighbor of Aksum finally invaded Himyar and conquered the realm, the formerly powerful state definitively lost significance.

### **Turning points in history**

“When we think of extreme weather events, we often think only of a short period afterward, limited to a few years,” Fleitmann says. The fact that changes in the climate can lead to states being destabilized, thereby changing the course of history, is often disregarded. “The population was experiencing great hardship as a result of starvation and war. This meant Islam met with fertile ground: people were searching for new hope, something that could bring people together again as a society. The new religion offered this.”

That does not mean to say the drought directly brought about the emergence of Islam, emphasizes the researcher. “However, it was an important factor in the context of the upheavals in the Arabian world of the sixth century.”

In tropical and subtropical regions, there is a connection (correlation) between the amount of precipitation and its isotopic composition, also known as the “amount effect”. The more it rains, the more the ratio between the lighter and heavier oxygen isotopes,  $^{16}\text{O}$  and  $^{18}\text{O}$ , shifts in favor of the lighter  $^{16}\text{O}$  in the precipitation.

These changes are recorded in the stalagmite from Oman, as it is formed from dripping rainwater. Based on isotopic measurements of the stalagmite’s limestone layers, it is possible to determine the exact ratio of  $^{16}\text{O}$  and  $^{18}\text{O}$  and, in combination with uranium dating, to reconstruct how much it rained at what point in time.

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Reference: “Droughts and societal change: The environmental context for the emergence of Islam in late Antique Arabia” by Dominik Fleitmann, John Haldon, Raymond S. Bradley, Stephen J. Burns, Hai Cheng, R. Lawrence Edwards, Christoph C. Raible, Matthew Jacobson and Albert Matter, 16 June 2022, Science.

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Please visit the site: <https://scitechdaily.com/scientists-finally-discover-what-caused-the-collapse-of-this-ancient-kingdom/> [Go there for pix]

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## **FLOORS IN ANCIENT GREEK LUXURY VILLA WERE LAID WITH RECYCLED GLASS, BY UNIVERSITY OF SOUTHERN DENMARK**

Although this 1700 years old luxury villa was excavated and examined both in 1856 and in the 1990s, it still has secrets to reveal.

New secrets have now been revealed by an international research team, with Professor and expert in archaeometry, Kaare Lund Rasmussen from University of Southern Denmark leading the so called archaeometric analyses: using chemical analysis to determine which elements an object was made of, how it has been processed, etc.

Others in the team are Thomas Delbey from Cranfield University in England and the classical archaeologists Birte Poulsen and Poul Pedersen from Aarhus University and University of Southern Denmark.

The team's work is published in the journal Heritage Science, including archaeometric analysis of 19, approximately, 1600 years old mosaic tesserae.

### **One of seven wonders of the world**

The tesserae originate from an excavation of a villa from late antiquity, located in Halikarnassos (today Bodrum in Anatolia, Turkey). Halikarnassos was famous for King Mausolus' giant and lavish tomb, which was considered one of the seven wonders of the world.

The villa was laid out around two courtyards and the many rooms were adorned with mosaic floors. In addition to geometric patterns, there were also motifs of various mythological figures and scenes taken from Greek mythology; e.g. Princess Europa being abducted by the god Zeus in the form of a bull and Aphrodite at sea in her seashell.

Motifs from the stories of the much younger Roman author Virgil are also represented.

Inscriptions in the floor have revealed that the owner was named Charidemus and that the villa was built in the mid-fifth century.

### **A costly luxury**

Mosaic flooring was a costly luxury: expensive raw materials like white, green, black, and other colors of marble had to be transported from distant quarries. Other stone materials, ceramics and glasses also had to be imported.

"I received 19 mosaic tesserae for analysis in my lab in Denmark. Of these, seven were of glass in different colors; purple, yellow, red, and deep red. My conclusion is that six of them are probably made of recycled glass," says Kaare Lund Rasmussen.

This conclusion is based on a chemical analysis called inductively coupled plasma mass spectrometry. With it, the research team has determined the concentrations of no less than 27 elements, some of them all the way down to a concentration of billionths of a gram.

Waning of Roman Empire—We were able to distinguish between base glass from Egypt and base glass from the Middle East and also, we could determine which elements were added by the ancient craftsmen to color the glasses and to make them opaque, which was preferred at the time, he says.

It is of course difficult to extrapolate from only seven glass mosaic tesserae, but the new results fit very well with the picture of Anatolia in late antiquity. As the power of the Roman Empire waned, trade routes were closed or rerouted, which probably led to a shortage of goods in many places—including raw materials for glass production in Anatolia.

This, together with the stories depicted on the floors, allows the classical archaeologists to put together a more detailed picture of what was fashionable in late antiquity and what the possibilities were for the artistic unfolding.

Please visit the site: <https://phys.org/news/2022-07-floors-ancient-greek-luxury-villa.html> [Go there for pix]

## **ANOTHER MYSTERY OF THE ANCIENT 'ANTIKYTHERA MECHANISM' MAY HAVE BEEN SOLVED**

The 'calibration date' of the mysterious 2,000-year-old device—the world's oldest computer—has been nailed down, according to new research.

By Becky Ferreira

The Antikythera Mechanism, an incredible 2,000-year-old artifact that has gained fame as the first known analog computer, has excited the imaginations of the public and experts alike since it was recovered from an ancient Mediterranean shipwreck more than a century ago.

Over the decades, researchers have unraveled the mysteries of this beautiful object, which used a sophisticated system of gears to keep track of cultural events, such as the Olympics, and to predict the motions of celestial bodies along the Saros Cycle, a 18-year period that is punctuated by lunar and solar eclipses.

Recent studies have unveiled dazzling digital reconstructions of the mechanism and pinned down its intricate inner workings, even though much of the artifact eroded away or was lost during its long entombment under the sea. Some experts have even speculated that the mechanism was designed or invented by Archimedes, the famed Syracusan polymath who lived in the 3rd century BC.

Now, a team led by Aristeidis Voulgaris, a researcher based at the Thessaloniki Directorate of Culture and Tourism in Greece, has revealed yet another new chapter in the evolving story of this ancient computer. Voulgaris and his colleagues believe they have pinned down the “initial calibration date” of the mechanism—meaning, the point in time that the whole system is referentially built upon—to December 22nd and 23rd, 178 BC, according to a recent study published on the preprint server arXiv.

“The special design, the very large number of parts and the complex construction of the Antikythera Mechanism lead to the conclusion that it was used in order to measure/calculate the time presenting the exported results/calculations via its pointers and scales,” said Voulgaris’ team in the study, which is not yet peer-reviewed. “It is obvious that the manufacturer of the Mechanism designed/constructed his creation and engraved the specific Saros eclipse sequence events, for a specific Epoch/initial date.”

Indeed, the Saros Cycle is explicitly built into the design of the Antikythera Mechanism in the form of a spiral dial that predicts lunar and solar eclipses. Researchers have tried to run the clock back in time before, with one previous study identifying an eclipse noted by the artifact that occurred on May 12, 205 BC.

Voulgaris and his colleagues arrived at a later date for a few reasons, including the positioning of the New Moon phase in the mechanism. They interpret the position of this phase to mean that the Saros Cycle would begin with an annular solar eclipse, a celestial event that occurs when the Moon is at its furthest position from Earth. As a result of this

distance, the Moon does not fully block out the Sun's light, causing an effect known as the "ring of fire."

To test their assumption, the team reviewed annular solar eclipses that occurred across centuries of ancient Greek history. In particular, they looked for eclipses that coincided with other significant events that might distinguish a date as a compelling yardstick for the mechanism.

Ultimately, the researchers settled on the annular eclipse that graced the skies on December 22nd, 178 BC, because it featured "a rare coincidence of astronomical events," according to the study. The eclipse happened one day before the Winter Solstice, which was a start date for many calendars at this time, and it also corresponded to the Sun crossing into the zodiac sign of Capricorn.

Voulgaris and his colleagues note that the Winter Solstice is prominently referenced on the mechanism, suggesting it was an important date to the maker, or makers, of the artifact. They also point out that those same winter dates marked "the celebration of the religious festival of Isia started in Egypt and the Hellenistic Greece," a "unique coincidence" that distinguishes this point in time as "an ideal, functional and representative initial date, in order to calibrate the initial position of the Mechanism's pointers," according to the study.

The new study has potentially identified an important reference point for the operation of the Antikythera Mechanism, though it will take more research to corroborate the team's hypothesis and the many other open questions about this perplexing machine and its creators.

**Please visit the site: <https://www.vice.com/en/article/v7d899/another-mystery-of-the-ancient-antikythera-mechanism-may-have-been-solved> [Go there for pix]**

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## **3,200-YEAR-OLD MESOPOTAMIAN PERFUME RECREATED FROM ANCIENT TEXT, BY NATHAN FALDE**

A woman named Tapputi carried the distinction of being the first female chemist in Mesopotamia and the first female perfume maker anywhere in the world, approximately 3,200 years ago. Working with a Mesopotamian perfume formula left on an ancient clay tablet that Tapputi herself made, a team of 15 scientists has now successfully recreated one of her Mesopotamian scents in a laboratory setting.

Turkish scientists working in cooperation with Turkey's Smell Academy and Scent Culture Association (Koku Akademisi ve Koku Kültürü Derneği) carried out an extensive investigation of Tapputi's Mesopotamian perfume-making methodologies. Their aim was to first understand what she did, and then possibly duplicate her work in as much detail as possible. They have now partially achieved their goals, although the efforts to translate and interpret the legendary Tapputi's work will continue.

Archaeologists found Tapputi's name inscribed on a pair of cuneiform tablets recovered during excavations in southern Turkey, which was part of Babylonian Mesopotamia in the second millennium BC. The tablets gave her full name as Tapputi-Belatekallim, with Belatekallim meaning "a female overseer of a palace." The tablets were dated to 1200 BC, and in their inscriptions Tapputi was described as a registered chemist and expert producer of fine Mesopotamian perfumes (which are unprecedented titles for a woman who lived that far in the past!).

On the tablets, Tapputi recorded her Mesopotamian perfume formulas and the steps she used to produce her scents in ancient Akkadian.

Fortunately, scholars know enough about this language that it was possible to translate what she had written.

To make her ancient perfumes, the recovered tablets revealed Tapputi used a combination of different types of flowers, oil, calamus, Cyperus, myrrh, horseradish, spices, and balsam, to name just a few of the ingredients identified. She would mix her various concoctions with water or other solvents, distill them, and then filter her liquid product many times to create a purer and more pleasant-smelling Mesopotamian perfume formula.

Out of this complex jumble of Mesopotamian information, they were able to eventually recreate one of her scent formulas in its entirety.

"In these tablets we were able to find answers to questions such as how she produced the scent and how she made the distillation process," explained world-renowned ancient fragrance expert and Smell Academy and Scent Culture Association leader Bihter Türkan Ergül in an interview with the Hurriyet Daily News. "Each cuneiform on the tablet gave us a different excitement and we made a travel in time when we were able to smell this scent [in the laboratory]."



As a part of her methodology, Ergül reveals, Tapputi would work under a full moon while seeking communion with the stars in the night sky.

This esoteric aspect to her Mesopotamian perfume-making activities was one of many secrets uncovered during translations of the two tablets that discussed Tapputi's innovative *modus operandi*.

Ergül and her team of experts produced 27 pages of translation from the two tablets, which were recovered during excavations near Harran, a sleepy village in Turkey that was a major urban center during Mesopotamian times.

“As the Fragrance Culture Association, we are keeping alive the scent traditions that have existed on these lands,” Ergül stated. We live on a land that has an 8,000-year-old scent culture.” The fragrance expert noted that there were hundreds of tablets that touch on fragrance production in ancient Mesopotamia unearthed during the excavations, and much work remains to translate them all.

“The main reason why Mesopotamia is rich in scent culture is its fertile soils,” she explained. “When we look at civilizations such as Assyria, Mesopotamia, Hittite, Seljuk and Ottoman, we see that Turkey is a fragrance civilization. We have been working on this project for about three years, researching the scent culture in Mesopotamia. In this process, we reached Tapputi, she is known as the world's first perfumer.”

Uncovering the Brilliance of the World's First Known Female Perfume Maker In addition to Ergül, there were 15 experts involved in this new study of Tapputi and her innovative work. These included Professor Mehmet Önal, an archaeologist from Ozyegin University who led the excavations at Harran, and Associate Professor Cenker Atila, an archaeologist from Sivas Cumhuriyet University and an expert on ancient ceramics, glass works, and perfumes. The research was carried out on artifacts that were previously recovered and have only now been translated after three years of strenuous and dedicated effort.

“There are two tablets in the world with the name Tapputi,” Atila explained. “One of them is in the Louvre Museum in Paris and the other in the Girl Museum in Germany. On the tablet in Louvre, it is stated that Tapputi was a perfumer who worked for kings. We have more information on the tablet in Germany. Unfortunately, half of the tablet is mostly broken. Despite this, we learn how Tapputi works with a female assistant whose name ends with -ninu and how she distills perfumes.”

While they discovered enough to identify all the ingredients used in one of Tapputi's scents, proceeding beyond this point could be a challenge. Atila highlights two problems his team has faced as they've attempted to learn more about Tapputi and her work.

“One of them is that the tablets were broken and some important parts were lost,” he said. “The second difficulty is that some plants and containers used 3200 years ago do not have the exact equivalent. For example, we do not know exactly what the “hirsu” vessel is. However, since it is used in the perfume distillation process, it should be a container like a flowerpot. In addition, the fact that we do not know the current names of some spices and flowers used in perfume production appears an important problem.”

Moving beyond the decoding of formulas and methodologies to the actual recreation of scents in a lab represents a big step. It has been done once so far, and the researchers hope they will be able to resurrect even more scents in the years to come, which will provide direct evidence of Tapputi's true brilliance as the world's first recorded female perfume-maker.

Please visit the site: <https://www.ancient-origins.net/news-history-archaeology/mesopotamian-perfume-0017057> [Go there for pix]

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## **THE 6,000-YEAR STORY OF THE NEGEV DESERT IS ETCHED IN STONE - MILLENNIA OF ROCK ART OFFER A LIBRARY OF HUMAN HISTORY IN THE LEVANT, BY GITIT GINAT**

LIOR SCHWIMER FIRST DISCOVERED THE world of Negev Desert rock art one summer 10 years ago. “I was preparing for a lecture,” says the archaeologist of the Southern District at the Israel Nature and Parks Authority, “and decided to take another look at a rock I’ve seen before, with an ibex carved on it. I went into a small valley and saw some rock carvings. I continued walking and saw a few more, not many.”

Then he followed the valley, known as Nahal Le’ana, as it curved. “I found myself on a slope with hundreds of rocks, each one carved with symbols, figures, inscriptions, and shapes of dozens of different hues and patterns,” he recalls. “I wandered between the rocks and felt like I just opened an invisible door to a giant library in the middle of the desert.”

The Negev holds thousands upon thousands of rocks adorned with carvings, sometimes in isolated sites such as Har Karkom, and sometimes in the midst of modernity. Har Mihya Park, for example, is a hill covered with rock piles carved with ancient ibexes and camels.

Down one side, a visitor can see the flesh-and-blood camels, tin shacks, and canvas tents of the Bedouin Yahala Desert Camp, and on the other side, the guest huts of Aurelia Farm. Not far from there, Carmey Avdat Farm produces chardonnay and merlot.

The window of Negev rock art opens onto the cultural and spiritual world of people who have lived in the desert—hunters, shepherds, itinerant merchants—since at least the fifth millennium B.C. and through the modern period. It’s one part history book, one part art gallery—the story of people in a place, written and drawn on the landscape itself.

“The carvers hold a dialogue with each other over millennia,” says Davida Eisenberg-Degen, an archaeologist with the Israel Antiquities Authority who studies the carvings. “We see how people from different periods paint inside older carvings, or add symbols and animals beside them. We guess this is an act that expresses identification, belonging, and familiarity.”

“This is a conversation taking place over 6,000 years.”

“On the other hand,” says Schwimer, “we also see negative interactions. We discovered many carvings where daggers, considered a token of identity, were erased. Erasure is an act of protest. It is possible that the ancient Negev was controlled [for a time] by copper merchants. After they left, tribes took over and erased the identity markers of their oppressors. In any event, this is a conversation taking place over 6,000 years.”

What makes the desert such a unique canvas are the rocks themselves.

They are covered with a thick, dark patina, formed as the surface interacts with oxygen, water, and sunlight. The researchers have studied the surface with X-ray fluorescence to examine its mineral and chemical properties. “There are bacteria in the rock,” Schwimer explains. “They adsorb iron from the rock and manganese from the dust in the air, and fix them.

“If you peck on the patina with a sharp tool, you find limestone underneath,” he adds. “Many peck points create a carving.” Scientists can examine the manganese of the patina to date it, but it’s also easy enough for a visitor to guess at the relative age of a carving by how dark the patina on the carving itself has grown. The darker the carving looks, the older it is, which can make it difficult to interpret the oldest of the carvings.

“The oldest drawing we found is a carving of ibexes from the Early Bronze Age. The older the carving is, we see a richer and more detailed artistic world. Drawing was a ritual activity at this point, the carver was trained for it, and the tribe assembled specifically to witness it,” Schwimer says. “[Later] carvings were made by copper merchants who rode down from Mesopotamia, Bahrain, or Jordan to Egypt.

A carving of an ox or a lion, [animals] which never existed here, is made by a Mesopotamian or an Egyptian merchant, and indicates the approximate path of the copper trading route. Later we see carvings made by Roman soldiers, or a shepherd who randomly passed by and wanted to leave his mark.”

“Over the last few centuries, it was Bedouins,” says Eisenberg-Degen, who has mapped these more recent Bedouin works. “Bedouin tribes crossed the desert from the east, the west, and mainly the south, and the carvings they left show us how Bedouin culture has changed: In earlier times a Bedouin tribe was a collective, and its symbol appears identical in carvings from the same period. During the agricultural period, some groups became more segmented and started to work separate plots. The symbols of the tribes also branched out. The symbol of the Azazme tribe, for example, appears initially as an arrow. Later the arrow has a longer horizontal line, or looks like a door with a long lintel.”

The oldest carvings depict animals, which had spiritual significance related to hunting and fertility. As a motif, the most common among them, the ibex, persists up until current times. “It is always a male ibex and almost always in heat, and it appears in areas in the desert where ibexes never lived,” Schwimer says. In certain mythologies, animals such as ibexes taught survival skills to humans, and some served as spiritual guides. Uzi Avner, a veteran researcher from the Dead Sea and Arava Science Center, suggested that the ibex symbolizes the circle of life and death, perhaps as a deity that dies and is resurrected, and is also related to rain and fertility.

Approximately 8,000 years ago, humans started to domesticate goats in the Negev, and the regional shepherd culture was born. According to Schwimer, “the domesticated camel first appeared in the Negev during the Iron Age, and carvings of camels start to appear during this time.

Next, we start seeing horse and donkey carvings.”

“So far I reviewed almost 15,000 panels with more than 50,000 carvings,” says Schwimer, who is in final stages of his doctoral research. In general, he focuses on the carvings of human figures.

Historically, these examples appear after the first animal carvings, and in hunting scenes or raising their hands to the sky. In Byzantine-era carvings they might depict a person carrying a cross or holding a chalice.

During the early Islamic period, due to the prohibition on human representation, the desert fills with camel carvings, etched tribal symbols, and written inscriptions. According to Eisenberg-Degen, most Bedouins who reside in the Negev today can't recognize the ancient tribal symbols on the rocks, but still continue the great tradition of Negev carvings—a tradition that has always reflected the world around it.

“We found carvings of a Volkswagen Beetle and a jeep from the 1950s,” she says. “There are airplane carvings next to an air base, carvings of hearts and board games. There are inscriptions in Arabic, and some in Hebrew and English—all made by Bedouins. Over the last 50 years you can also see carvings made by women, who, like the male shepherds, started to add their names.

“As archaeologists, we usually uncover buried findings, and our job is to understand what period are they from and what they were used for,” she continues. “On the other hand, when we study carvings, we understand just what happened in that moment. We see where the person sat, what they were looking at, and what were they thinking about at that very moment.”

**Please visit the site: <https://www.atlasobscura.com/articles/negev-desert-rock-art>  
[Go there for pix]**

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## **ANCIENT GREECE WAS A DEBAUCHED DISNEY TRIP FOR ROMANS, BY ADRIENNE MAYOR**

There were guidebooks with reviews, an ancient version of rental cars, luxury island hopping, and plenty of gimmicks. The ancient Romans were just like us!

Ages before modern tourists flocked to Greece to enjoy its sun, sea, antiquities, and adventure, people of the Roman Empire descended on Greece for the same reasons. Antony and Cleopatra headed for a romantic island tryst on Samos; the emperor Tiberius preferred Rhodes.

Some Romans attended the famous philosophy schools and drenched themselves in Greek history; others came for the Olympic Games; still others were attracted by the sensational—a chance to gawk at the egg hatched by Leda after her affair with Zeus in the guise of a swan, to dip a toe in the spring where Helen had bathed, or to gasp as professional divers jumped off the notorious “Lover’s Leap” of Leucadia, a 200-foot promontory where Sappho was said to have ended her life. And they all lugged home souvenirs: terracotta statuettes, trinkets, pots of Hymettian honey, silk scarves from Cos, gnarled walking sticks from Sparta, copies of racy Milesian love stories, and entire temple columns and thousands of statues.

Greek hospitality was renowned long before the Roman sightseers arrived. People who traveled often had “guest-friends” in Greek cities, and as early as the fifth century B.C. innkeepers let rooms in towns and along roads. Famous temples and sanctuaries provided public accommodations run by the host city or by other cities for their own citizens visiting the shrine. The fourth-century politician Demosthenes mentioned a hotel popular with ambassadors near the Temple of the Twins in Pherae on the northern coast of Greece, and the remains of an ancient hostel for visitors to Athens was found in Plateia in modern times.

Herodotus was one of the first ancient writers to travel purely for curiosity and pleasure in the fifth century B.C.. His books related the many strange customs and marvels he saw and heard about on his tours (see chapters 1 and 21). By the fourth century B.C., foreign travel was becoming more common, as diplomats, messengers, mercenaries, tradespeople, merchants, poets, philosophers, musicians, artists, actors, and athletes all traveled for business, education, or pleasure. Ordinary and rich folk alike made journeys to attend festivals and religious celebrations.

In the fifth century B.C. Sparta allowed visitors only short, rigidly supervised tours of its sights and restricted the travel of its own citizens. By Roman times, however, Sparta had become a sort of “theme park,” a must-see on every tourist’s list, where Old Sparta’s myths, legendary austerity, and harsh discipline were glorified. Gullible tourists could view Leda’s Egg (out of which Helen of Troy hatched; sophisticated travelers dismissed the large beribboned egg as that of an ostrich). Those familiar with the verses of the popular Roman poet Ovid probably hoped to see beautiful Spartan women wrestling in the nude, but they had to settle for statues of clothed female runners or women warriors

brandishing swords. Tourists could watch endurance contests in which stoic Spartan teenagers were flogged, in the theater built by Roman entrepreneurs to accommodate hundreds of spectators. Or they could witness puppy sacrifices, exciting boar hunts, and brutal mock battles; visit the cave where criminals were confined, the altar where human sacrifices took place, and the notorious gorge where weak children were left to die. They could admire “vicious Laconian hounds” paraded on leashes; and wander through the impressive “victory” colonnade displaying Persian spoils and columns in the forms of chained captives.

Many of the bloodthirsty images of ancient Sparta current today actually come from descriptions of these commercialized sideshows created to entertain the Roman tourists.

Travelers stayed at inns along roads, near the city gates, or in the town center. Then, as now, the comforts of these lodgings varied enormously. In the cheapest, travelers had to provide their own food and linens, and they could expect to encounter hard beds, bedbugs, mosquitoes, little privacy, shady characters, and brawls. Wealthier tourists avoided these quarters and booked accommodations in luxurious converted mansions, with garden patios or dining rooms catering to Romans used to reclining during dinner. Wayfarers could buy simple snacks and wine at a modest café called a *kapilos*. All inns of the day provided sexual companionship of varying standards and costs.

Rich, famous, and powerful globe-trotters, such as Cleopatra and Antony, who cruised the Aegean in 40–30 B.C., traveled first class. In April of 32 B.C. the pair sailed from Ephesus to Samos, bringing with them a retinue of popular actors, comedians, and musicians. For three weeks their revels were the talk of Greece: the island resounded with the sounds of pipes and lutes; there were sumptuous drunken banquets and all-night performances. Cleopatra’s souvenirs from Samos included life-size bronze statues of Zeus, Athena, and Heracles taken from the Temple of Hera. She also took home scores of paintings and thousands of books. Antony bought Greek costumes for himself. Cleopatra was hoping to persuade Antony to get a divorce from his wife in Rome. But he was preoccupied with the upcoming showdown with Octavian (future emperor Augustus) in the Adriatic. The couple sailed from Samos to Athens, alternately bickering and making up all the way.

The tempestuous affair continued in Athens, where the city raised statues to both lovers on the Acropolis and hailed Cleopatra as the Goddess of Love and Antony as Dionysos. There were more riotous drinking bouts, torchlight parades, and outrageous behavior. Antony dressed up in a Dionysos costume. Cleopatra bought tablets of onyx and crystal, had them inscribed with love letters, and sent them to Antony. Antony caused a scandal by caressing her feet in public. The lovers moved their celebrations to the city of Patras, but by September of 30 B.C. the party was over. They both committed suicide after their fleet was defeated by Octavian at Actium in the Gulf of Preveza.

A Roman sightseer’s list of not-to-be-missed destinations reads like the itinerary of today’s traveler: Athens and its harbor Piraeus, Delphi, Corinth, Sparta, Olympia, and Epidauros. The Olympic Games and those at Nemea, Delphi, and Isthmia continued full bore, and there were Greek theatrical, literary, oratorical, and musical events galore. Local folk dances and festivals drew spectators, and energetic tourists, such as the emperor Hadrian, climbed mountains for the spectacular views. Strabo, the geographer of the first century B.C. who described the diving shows that took place at Sappho’s Leap,

was very impressed with the sunset panorama visible from the great Acropolis of Corinth.

In about AD 160, Pausanias wrote *A Description of Greece*, the first guidebook and the model for all subsequent efforts. Pausanias's Greek vacation lasted between 10 and 20 years. Some speculate he began his trip to forget an unhappy love affair, as had Propertius, whose grand tour to Greece was undertaken to "erase the scar in my heart." Pausanias's guidebook, written for philhellenic sightseers and still relied on today, is jam-packed with information on history, sights, road conditions, time-saving hints, and curiosities throughout the Greek world.

By the time Pausanias began his excursion, the Roman Empire was maintaining and policing roads (many of which are still extant) and regulating inns, mules, and carriages in Greece. Carts could be hired in one city and left in the next, like modern rental cars. The emperor Hadrian had widened the road from Athens to Corinth to accommodate two lanes of chariots, and the great Via Egnatia connected the northwest coast of Greece with Constantinople. Nero and other investors built inns along the Via Egnatia. Large public latrines were constructed near the Agora in Athens to accommodate visitors. At famous sites, cicerones offered their services and guidebooks were hawked, along with souvenirs and art reproductions. In the Agora, for example, one could buy miniature busts of Socrates near the "very spot where he drank the hemlock." The Oracle at Delphi, once consulted by kings and emperors on foreign policy, had become a Guru to the Stars—wealthy private citizens, including Cicero and Nero, now made the journey to have their fortunes told. Other oracles and fortune-telling concessions proliferated—Pausanias described dozens of them, featuring dice, mirrors, lizards, birds, dream interpretations, and magic potions.

Pausanias sought out places of historical or romantic interest, and he was always on the lookout for antiquities. Like Herodotus, Pausanias sometimes made a nuisance of himself with his curiosity, pestering and contradicting local guides and arguing with other tourists over fine points of ancient Greek religion. He usually traveled by horse cart, going on foot when the route was narrow and "only fit for an active man." Complaints about steep footpaths and bad roads pepper his book, but Pausanias always lets the reader know whether the sight is worth the trouble.

Local guides pointed out so many "Hercules slept here" places and "Helen bathed here" pools that Roman tourists must have pounced on Pausanias's rating system with sighs of relief. His ratings ranged from the superlative "you'll gasp," "I was amazed," "my favorite," "very worthwhile," and "delightful," to downright "silly," "stupid," "utterly idiotic," and "waste of time." In his many years of touring Greece, Pausanias was shown countless Helen's Pools and Hercules Passed Here attractions. Epidauros, for instance, boasted an olive tree "twisted by Hercules himself." He admired myriad springs bubbling up where Pegasus Stamped His Hoof (there was one in Corinth), places where Medusa Was Slain (Argos had one of these), springs where Hera Renewed Her Virginity (one near Eleusis and another at Nauplion), shady glades where Dionysos Stopped for a Drink or Zeus Met a Maiden (ubiquitous), grottoes where Pluto Abducted Persephone to the Underworld (at Nauplion, Troezen, Hermione, Boeotia, etc.), caves of Various Lions Wrestled by Hercules (Tiryns, Nemea, Mount Kitheron), and dozens of rival birthplaces and graves of heroes and gods.



On the Corinthian Gulf near Patras, Pausanias found “a delightful place for idling in the summer.” He noticed that Patras itself had twice as many women as men, and “if ever women belonged to Aphrodite, they do!” These women were expert weavers of cotton and flax, and their decorative hairnets and dresses were popular souvenirs of Patras. Pausanias consulted no fewer than three fortune-telling oracles near here, and he was enchanted by the story of a man who fell hopelessly in love with a faithless mermaid in the Selinous River.

Bathing in the river, the guides assured Pausanias, could make one forget an unhappy passion. “If true, the river water is worth more to mankind than any amount of money,” he remarked. His discovery of the delights of the coast near Patras, like Tiberius’s fondness for volutas (evening strolls) with villagers in Rhodes, and Strabo’s ascent of Acrocorinth for the thrilling view, remind us that, besides the glorious antiquities and stirring history, it is this glimpse of the real and present Greece, the unique out-of-the-way experience, that every visitor hopes to treasure as a personal souvenir.

By the third century A.D., worsening economic and social conditions, not to mention barbarian hordes, made gadding about the Mediterranean for the pure fun of it simply too adventurous for most people. After three centuries of relatively safe travel guaranteed by the “Roman peace,” more than a thousand years would pass before philhellenes would again make Grand Tours to Greece to satisfy curiosity and to seek history and adventure.

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