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

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

Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας

- Ιανουάριος 2019 -

ΕΥΤΥΧΙΣΜΕΝΟ ΤΟ ΝΕΟ ΕΤΟΣ 2019
HAPPY NEW YEAR 2019

Newsletter of the Hellenic Society of Archaeometry

- January 2019 -

Nr. 214

ΠΙΝΑΚΑΣ ΠΕΡΙΕΧΟΜΕΝΩΝ – TABLE OF CONTENTS

ΣΥΝΕΔΡΙΑ - CONFERENCES/WORKSHOPS

METAL PROVENANCING IN THE SOUTHERN LEVANT AND BEYOND, FEBRUARY 2-4, 2019

Hosted by the Laboratory for Archaeological Materials and Ancient Technologies (LAMAT), The Institute of Archaeology, The Hebrew University of Jerusalem (HUJI) and The French Research Center in Jerusalem (CFRJ)

Saturday-Sunday, February 2-3
Excursion to mines and smelting camps in the Arabah (Timna Valley and Wadi Amram)

Monday, February 4
Barbara Mandel Auditorium, Mandel Building, Mount Scopus, HUJI

9:30-13:00 First Session: Sourcing Iron
Chair: Prof. Yigal Erel (Institute of Earth Sciences, HUJI**)**

Provenance of Iron: A New Approach! (**Michael Brauns,** Curt-Engelhorn-Zentrum Archäometrie, An-Institut der Universität Tübingen**)**
Potential Iron Sources of the Iron Age Southern Levant; Survey, Analyses and Experiments **(Adi Eliyahu-Behar,** Ariel University**)**
Hematite Objects from Iron Age Sites as a Proxy for Iron Sourcing **(Adi Shulman,** The Program of Environmental Sciences, HUJI)

Coffee Break

Understanding the Earliest Iron Artifacts in South Eastern Arabia **(Ivan Stepanov,** Ariel University**)**
Iron Economy during the Early Iron Age in Northern France and Western Germany: Approaching the Origin and Circulation of Iron (**Sylvain Bauvais,** CNRS, Paris)
Local or Foreign Iron during the 2nd Millennium AD in Coastal Countries of West Africa?" (**Caroline Robion-Brunner,** CNRS, Paris)

Lunch Break

14:00-17:00 Second Session: Non-Ferrous Metals
Chair: Prof. Sariel Shalev (University of Haifa)

Inscribed Lead Ingots from Caesarea **(Naama Yahalom-Mack,** Institute of Archaeology, HUJI, **Assaf Yasur-Landau** and **Ehud Galili,** University of Haifa**)**
The Source of Levantine Silver in the Iron Age I: The Problem of Cu-Ag Alloys **(Tzilla Eshel,** University of Haifa and HUJI)

Coffee Break

Mining Referentials for Metal Tracing in Ancient Times (**Sandrine Baron,** CNRS, Paris) Remarks on the Provenancing of Copper from Cyprus **(Vasiliki Kassianidou,** University of Cyprus)

17:30 Dinner Reception at the French Research Center in Jerusalem, 3 Shimshon St.

To confirm your participation in the conference and/or excursion please contact Naama Yahalom-Mack (naama.yahalom@mail.huji.ac.il).

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RADIOCARBON AND ARCHAEOLOGY 2019, UNIVERSITY OF GEORGIA, ATHENS, GA, USA

Happy Holidays from the organizers of the 2019 Radiocarbon and Archaeology Symposium!

Hello Colleagues,

As the New Year approaches, we hope that your meeting preparations are underway, and we are happy to bring you end of the year announcements.

Submit your Abstract through the Online Portal!

Online abstract submission for poster and paper presentations opened in early December on the www.radiocarbonandarchaeology2019.com website.

All abstracts are due by February 1st, 2019.

Thank you to everyone that submitted a session abstract. We have a wide array of chaired and general sessions planned for the meeting. Before submitting your paper or poster abstract, please take the time to read through the session abstracts to find the right fit for your presentation. Full session abstracts can be found here and a list of session titles and organizers can be found below.

Chaired Sessions

^{14}C and the Protection of Cultural Heritage
Chairs: Tim Jull and Irka Hajdas

Time to Eat: Recalibrating Dietary Changes and Domestication in Human History
Chair: Timothy Baumann

Coastal Archaeology
Chair: Susanne Lindauer

Beyond Site Sequences
Chairs: Seren Griffiths and Derek Hamilton

Latin America Archaeology
Chair: Kita Macario

Resolving Ambiguities in Calibrated Age Determinations
Chairs: Jennifer Birch and Sturt Manning

Radiocarbon Laboratories Past & Present
Chair: Jeff Speakman

Archaeology and the Environment
Chair: Kita Macario

General Sessions

Developments in Sample Pretreatment

Peopling of the World

Statistical Analysis and Modeling

Calibration and Calibration Records

Once you have chosen a session, please submit your abstract via the online system. All abstracts are due by February 1st, 2019.

Meeting Registration

The online meeting registration portal will be open shortly following the New Year allowing for early-bird registration. Through this portal and our upcoming events page, you will be able to register for the meeting, the Gala dinner, and the day-trip to Ocmulgee National Monument. More details coming very soon.

Newsletter

We are happy to say that newsletter interest is growing, and we are doing our best to add all interested parties to the list. To assist with making this a more comprehensive mailing list, please direct your friends and colleagues to www.radiocarbonandarchaeology2019.com where they can quickly join the mailing list via the form at the bottom of any page.

Happy Holidays from the 2019 Radiocarbon and Archaeology team!

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Radiocarbon and Archaeology 2019
University of Georgia
Athens, GA
USA

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NANORESTART PROJECT (2015-2018), MONDAY 21 JANUARY 2019, LONDON

Join us in London on Monday 21 January 2019, 18:30 to 20:00, to hear from Prof Piero Baglioni, Dr Bronwyn Ormsby and Rachel Barker about recent findings from the NANORESTART research project.

Drawing on nanotechnology, Tate and its partners across the EU have developed innovative materials to clean and conserve modern and contemporary art. Learn about the potential of these technologies and how they have helped protect some of the twentieth century's best-known artworks.

Prof Piero Baglioni is a professor of Physical Chemistry at the University of Florence and director of the Italian Research Center for Colloid and Nanoscience (CSGI). He is the Principal Investigator of the NANORESTART project.
Dr Bronwyn Ormsby is Principal Conservation Scientist at Tate. She manages the Conservation Science and Preventive Conservation section of Tate's Conservation Department.

Painting Conservator Rachel Barker carried out the conservation treatment on Lichtenstein's Whaam! After 20 highly successful years at Tate, she has recently established a private conservation practice in London, with a focus on modern and contemporary paintings.

More information and tickets:
https://www.tate.org.uk/whats-on/tate-britain/talk/conserving-contemporary-art-nanorestart

The NANORESTART project (2015-2018) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646063.

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Luigi Galimberti
Collection Care Research Manager, Tate

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13TH INTERNATIONAL CONFERENCE MACH2019 CONFERENCE ANNOUNCEMENT, "METHODS OF ABSOLUTE CHRONOLOGY", TARNOWSKIE GÓRY, POLAND, 5 -7 JUNE 2019

Dear colleagues,

I would like to invite anyone practicing, using, applying, analysing, performing, evaluating, doubting, loving - etc. - any chronological tool to the next MACh Conference – yes that's our 13th time!

The multidisciplinary conference will concern the following subjects:

1. Methods of absolute chronology and their application in Quaternary geology.

2. Dating methods and creation of absolute time scales for paleoclimatic reconstructions.

3. Isotopic methods in research of paleo- and modern environment.

4. Dating the archaeological objects.

The conference scientific programme includes plenary and poster sessions. The working language of the conference is English. The conference will be accompanied by a workshop for young scientists with lectures covering the basics of isotope and dosimetric dating methods

Organised by the Gliwice Absolute DAting Methods Centre, Institute of Physics – Centre for Science and Education, Silesian University of Technology.

Website: http://www.carbon14.pl/13thMAC/

With best regards,

Natalia

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INQUA SESSION: 'ROLE OF THE INTCAL RADIOCARBON CALIBRATION CURVES IN QUATERNARY SCIENCE'

Dear all

Please note that the deadline for abstract submissions for INQUA2019 is 9 January 2019!

If you utilize the IntCal radiocarbon calibration curves in your research or have new analyses that may provide information for future calibration curves please consider submitting an abstract to the session 'Role of the IntCal radiocarbon calibration curves in Quaternary Science' in the special sessions under INQUA Commission: Stratigraphy and Chronology.

Further information is available at: http://www.inqua2019.org/call-for-abstracts/

Session description:
Radiocarbon ages need to be converted into calibrated or calendar year equivalents in order to compare to records on other timescales or calculate rates of change. The key requirement for this conversion are the calibration curves which are updated and refined by the IntCal Working Group and ratified by the international radiocarbon community. These curves are based on the latest research focused on understanding the past ^{14}C content of the atmosphere and the ocean, and on the development of new statistical techniques.

The utility of the IntCal radiocarbon calibration curves goes far beyond conversion of radiocarbon ages to calendar year equivalents. The curves provide a means to integrate palaeoclimate records on other timescales, such as ice core or U-Th dated speleothems, with marine or terrestrial sediments dated by radiocarbon or archaeological records with additional chronological information. In addition the curves for the North and South Hemisphere provide past atmospheric ^{14}C levels for input into models of solar activity and ocean general circulation models.

This session will highlight new analyses that provide information for future calibration curves or that utilize the IntCal calibration curves to improve understanding of earth systems science.

Paula J. Reimer and Christopher Bronk Ramsey

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Prof. Paula J. Reimer, MRIA

Director, Centre for Climate, the Environment & Chronology (14CHRONO) School of Natural and Built Environment Queen's University Belfast Belfast BT7 1NN UK

websites:
chrono.qub.ac.uk

calib.org

Phone: +44 (0)28 9097 3980

Shipping address:
Archaeology & Palaeoecology Building
42-66 Fitzwilliam Street
Belfast BT9 6AX
UK

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ΘΕΣΕΙΣ ΕΡΓΑΣΙΑΣ/ΥΠΟΤΡΟΦΙΕΣ – JOB VACANCIES/FELLOWSHIPS

POSTDOCS: 2, ON THE AEGEAN WRITING SYSTEMS (BOLOGNA)

I am delighted to draw your attention to two post-doc positions (initially 3 years, renewable for a further 2 years) at the University of Bologna, Department of Classical Philology and Italian Studies, as part of the ERC project (Consolidator 2018-2023): INSCRIBE --Invention of Scripts and their Beginnings.

INSCRIBE is devoted to the analysis of the invention of writing through a multi-stepped methodology that includes linguistics, archaeology, anthropology, iconography, cognitive studies, and digital humanities.

The 2 post-doc positions pertain to the second strand of the project, which focuses on the undeciphered writing systems from the Aegean, dating to the second millennium BCE (Cretan Hieroglyphic, Linear A and Cypro-Minoan).

Candidates are expected to have a PhD in a related subject, and to devote their research to:

1. The analysis of the relationship between Cretan Hieroglyphic and Linear A, through the lens of palaeography and archaeology.

2. The analysis of the Cypro-Minoan script vis à vis Linear A.

The deadline for applications is 22 January 2019.

To read the application procedure and apply apply:
https://www.unibo.it/it/ateneo/concorsi-e-selezioni/bandi-ricercatore-a-tempo-determinato/2018/rif-74362013-bando-per-due-posti-da-ricercatore-a-tempo-determinato-a-junior-dipartimento-di-filologia-classica-e-italianistica2013-ficlit-l-fil-let-01

For inquiries, do not hesitate to e-mail me: s.ferrara@unibo.it To visit the website: https://site.unibo.it/inscribe/it

ΑΝΑΚΟΙΝΩΣΕΙΣ - ANNOUNCEMENTS

TRAINING COURSE - GLASS IN THE MEDITERRANEAN AND THE NEAR EAST ARCHAEOLOGY AND ARCHAEOMETRY FROM THE LATE BRONZE AGE TO THE EARLY MEDIEVAL PERIOD

This five-day course provides an introduction to archaeological glass, its typology, technology, composition and chronological development.
It will be of interest to students, early career researchers and others who wish to engage with current research on ancient glass. It comprises daily lectures (20 hours), glass handling sessions, workshops/demonstrations on chemical analysis and scanning electron microscopy of glass, as well as a museum visit (10 hours).

The course co-coordinators and instructors are Dr.Yael Gorin-Rosen (Israel Antiquities Authority, Jerusalem) & Prof. Ian Freestone (UCL Institute of Archaeology, London) with contribution by Dr. Carlotta Gardner (Fitch Laboratory, British School at Athens).

Course Fee: The course fee includes tuition, teaching materials, daily coffee and biscuits, and a welcome and a farewell meal, plus BSA membership for a month including 24 hour access to the superb library and entry to archaeological sites and museums in Greece. The fee is £460. Self- catering shared accommodation (twin rooms, including breakfast; £18.00 per night) at the BSA Hostel will be available for booking for a limited number of successful applicants. Please check the BSA's website for further information (https://www.bsa.ac.uk/member- services/accommodation/). Travel to and from Athens and health insurance are the sole responsibility of the course participant.

The course is limited to 12 places. The successful candidates will be informed by mid February 2019. Post-graduate students are recommended to apply to their universities for financial support; limited funding will be available (to cover part of the fees) only for students who would otherwise be unable to attend and they should express their interest in such financial support in their application.

Applications forms can be downloaded from the BSA website (check https://www.bsa.ac.uk/courses/glass-in-the-mediterranean-and-the-near-east/).
Applications should be submitted to the Fitch Laboratory administrator, Ms Zoe Zgouleta via e-mail zoe.zgouleta@bsa.ac.uk).

Closing date: 28 January 2019. References must also be received by then through e-mail: it is the applicant's responsibility to ensure that the references are sent.

For further information, please check the relevant sections on the British School at Athens web pages (http://www.bsa.ac.uk/) or contact either of the two course coordinators, Prof. Ian Freestone (i.freestone@ucl.ac.uk) or Dr.Yael Gorin-Rosen (yael.gorin.rosen@gmail.com).

Biographies

The course tutors have collaborated on glass projects for two decades.
Their early papers on the archaeology and archaeometry of Levantine glass production are widely cited and articulated a production model which has now become widely accepted.

Yael Gorin-Rosen is a leading specialist in ancient glass. She established the Glass Department of the Israel Antiquities Authority in 1991 and has headed it since then. From 1996 to 2002, she taught ancient glass at the Bezalel Academy of Art and Design in Jerusalem, where in 2017-2018 she is an invited lecturer. She taught at the University of Haifa during 2017. Yael Gorin-Rosen has participated in and supervised several excavations, including the biggest ancient glass production site ever excavated in the world: the raw glass industry at Bet Eli'ezer, Hadera (1992) and more recently the raw glass furnaces at Jalame (2015−2016). She has published more than 100 reports on glass vessels from excavations in Israel, dating from the Hellenistic period to the Middle Ages.

Ian Freestone joined the Institute of Archaeology London as Professor of Archaeological Materials and Technology in 2011. From 1979 he worked in the British Museum as a research scientist, then moved to Cardiff University in 2004, where he was first Professorial Research Fellow then Head of Archaeology. He has published extensively on early glass and ceramics and is a recipient of the Archaeological Institute of America's Pomerance Medal for scientific contributions to archaeology. He is a member of the editorial boards of Archaeometry, the Journal of Archaeological Science and Journal of Glass Studies. He currently serves as Chair of the Fitch Laboratory Committee of the British School at Athens.

ΠΜΣ "ΣΥΝΤΗΡΗΣΗ ΤΗΣ ΠΟΛΙΤΙΣΤΙΚΗΣ ΚΛΗΡΟΝΟΜΙΑΣ"

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ΠΜΣ "Συντήρηση της Πολιτιστικής Κληρονομιάς"
Πανεπιστήμιο Δυτικής Αττικής
Σχολή Εφαρμοσμένων Τεχνών και Πολιτισμού
Τμήμα Συντήρησης Αρχαιοτήτων και Έργων Τέχνης
Τηλ.: (0030) 210 5385459
(0030) 6946790417
Φαξ: (0030) 210 5385406

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THE BRITISH SCHOOL AT ATHENS PREHISTORIC, GREEK AND ROMAN POTTERY COURSE

Dear Colleagues,

We would be grateful if you could help us circulate the advertisement for the British School at Athens Prehistoric, Greek and Roman Pottery Course that will take place in 5th-17thApril 2019.https://www.bsa.ac.uk/courses/greek-and-roman-pottery/.

This intensive course gives participants a unique opportunity to gain hands-on experience with one of the major pottery sequences in Greece, guided by leading specialists in the field. Based at the British School's Research Centre at Knossos, it makes use of the rich holdings of the Stratigraphic Museum which include material from across the Mediterranean in all periods from the Neolithic to Late Roman. Strewing and examining key pottery groups will allow participants to learn the key points of identification and major debates for each period. Essential skills, like drawing and macroscopic fabric analysis, are taught in supporting workshops, and a series of lectures will introduce themes, problems and methods in the study and publication of ceramics. Towards the end, each participant has the opportunity to undertake a case study project.The course also comprises field classes to abandoned pottery workshops of the late 19th century, potting villages, visits to important Bronze Age, Classical, Hellenistic and Roman archaeological sites, along with the Heraklion Archaeological Museum. Local potters, specializing in traditional techniques, provide practical experience of all stages of pottery production. The course coordinator is Dr Kostis S. Christakis (The Knossos Curator) and instructors are Prof. Todd Whitelaw (UCL Institute of Archaeology), Dr Colin Macdonald (British School at Athens), Dr Conor Trainor (University of Warwick), Mr Antonio Bianco (University of Crete), Dr Maria Choleva (Postdoctoral Research Fellow UCLouvain), Dr. Carlotta Gardner (Williams Fellow in Ceramic Petrology, Fitch Laboratory), and Dr Denitsa Nenova (UCL Institute of Archaeology). The course is primarily intended for postgraduate students wishing to acquire or strengthen vital archaeological skills, but applications from late stage undergraduates with a strong intention to continue their studies will also be considered. The course fee of £750 includes tuition, teaching materials, room and board (shared accommodation in double rooms with breakfast and some lunch) at the British School's Research Centre at Knossos, fieldtrip travel expenses, 24-hour access to the Library, and BSA membership. Travel to and from Heraklion is the sole responsibility of the course participant. Students are recommended to apply to their universities for assistance with the fees. A very limited number of bursaries may be available from the BSA for those who would be otherwise unable to attend. Application forms can be downloaded from the British School website (www.bsa.ac.uk). Completed application forms and an academic reference letter (it is the applicant's responsibility to ensure that her/his reference is sent) should be emailed to the Knossos Curator Dr Kostis S. Christakis **by 22ndFebruary 2019**.

For further information contact the course coordinator Dr Kostis S. Christakis (knossoscurator@bsa.ac.uk).

All the best

Kostis S. Christakis

INTERNATIONAL FIELD SCHOOL ON SITE FORMATION, STRATIGRAPHY, AND GEOARCHAEOLOGY IN THE ATHENIAN AGORA

Deadline: March 1, 2019

The Malcolm H. Wiener Laboratory for Archaeological Science (ASCSA) in collaboration with the ASCSA Excavations at the Athenian Agora offers a full week-long **Field School on Site Formation, Stratigraphy, and Geoarchaeology in the Athenian Agora**. Dr. Panagiotis (Takis) Karkanas, director of the Wiener Laboratory and Paul Goldberg, Professorial Research Fellow University of Wollongong, will supervise the intensive field school. Registered students will be involved in interdisciplinary field research in the Athenian Agora primarily focused on archaeological context, geoarchaeology, and material sciences. Through field observations, laboratory analysis, and lectures, the students will receive instruction in the study and analysis of archaeological sediments and deposits, as well as gain experience in the recording of stratigraphy, and the understanding site formation processes. **A maximum of 12 students will be accepted for the course.** Preference is given to advanced students and post-docs with a background in archaeology, and preferably some exposure to the natural sciences as well.

The cost for Room and Board is 300 euros for the entire week. Travel costs to Greece and to the site are not included.

The course will take place from June 2 to 8, 2019. Applications should be submitted no later than 1st March via the online application form: https://ascsa.submittable.com/submit/127620/international-field-school-on-site-formation-stratigraphy-and-geoarchaeology-in

Application materials include one paragraph explaining why the candidate is interested in participating in the course, a CV, a list of grades (unofficial transcript), and names and email addresses of two referees.

Participants who successfully complete the course of instruction will receive a certificate detailing the content of the field school.

Textbooks: *Reconstructing Archaeological sites* 2019 by Panagiotis Karkanas and Paul Goldberg (Wiley Blackwell), *Practical and Theoretical Geoarchaeology* 2006 by Paul Goldberg and Richard I. Macphail (Blackwell) and *Microarchaeology* 2010 by Stephen Weiner (Cambridge University Press).

A syllabus will be emailed 3 weeks before the start of the field school.

For further information or questions, please contact Dr. Panagiotis (Takis) Karkanas at tkarkanas@ascsa.edu.gr.

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Programs Administrator
American School of Classical Studies at Athens

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INTERNET SITES

REDISCOVERING ANCIENT GREEK MUSIC

Please visit the site: https://youtu.be/4hOK7bU0S1Y

ΝΕΕΣ ΕΚΔΟΣΕΙΣ – NEW PUBLICATIONS

CLIMATE CHANGES IN THE HOLOCENE: IMPACTS AND HUMAN ADAPTATION

Edited ByEustathios Chiotis

Contents

Preface

Although global warming is not overlooked as an anthropogenic climate change, this book is focused on natural climate changes and their environmental and societal implications in the last ten thousand years.
The motivation for this collective work originated in the impressive scienti_c progress in climate sciences, in the evaluation techniques of archaeological material, and in genetics and modelling in the last decade. It is astonishing that detailed past environmental information is recorded in natural archives, which can now be retrieved and analyzed and this necessitates the closer synergy, the consilience, of natural sciences and humanities.
The book is practically an application of the Unity of Knowledge, as highlighted by Wilson,*and the current transition of the focus of the natural sciences from the search for new fundamental laws toward new kinds of synthesis in order to understand complex systems based on coherent cause-and-effect explanations. The system of our interest is the climate, in the frame of the Earth system, over the short— but critical for our civilization— period of the current interglacial.
The first section deals with the climate system which is fundamentally outlined in a broader than usually sense in the first introductory chapter, which is completed with a glossary of definitions. In particular, emphasis is given in the first chapter on the Cenozoic geological background and temperature trend, the global climate changes in the Holocene, the “global” monsoon and the carbon cycle. The second chapter refers to the most powerful tool of paleoclimatology, the proxy indicators and their quantitative application in environmental reconstruction, considering in tandem the necessary limitations. Chapter 3 on Pleistocene glaciations highlights the complexity of Earth system’s dynamics, the astronomical reasons underlying the alternation of glacial and interglacial conditions in the last three million years, the mechanisms of glaciations and deglaciations, and finally explains why the available data advance the hypothesis that we are now en route for an exceptionally long interglacial. Chapter 4 on solar irradiance variability investigates the potential mechanisms of solar influence on climate and the final chapter of the section on the climate system focuses on the factors of climate change

over the last two millennia, the climate reconstruction methods, the main characteristics of the climate of the last 2,000 years and the implications on societal changes.

This first section, and the whole book as well, should not be considered simply as a repository of functional knowledge; the scope extends further into the inter-relationships of diverse sources of evidence and the methods of their integration into a system approach, so that dogmatic application of knowledge is avoided, a case often encountered with abrupt climate events.

The following second section includes a narrative of the dispersal of modern humans out of Africa and a case study for the application of DNA in tracing migrations in Eurasia in the last ten thousand years. It is demonstrated in this Section that migration was a mainstay of human adaptation from early in our evolutionary development and that our ancestors possessed an ability and willingness to venture far a_eld, very likely encouraged, if not forced, by altered environmental conditions. Astonishing conclusions can be drawn from DNA studies, as substantiated in Chapter 7 in a genetic study referring to Cyprus.

The most extensive third section deals with the human responses to climate throughout the Holocene over a huge belt from Mesoamerica, Northern Africa, Arabia, Mediterranean, the Iranian Plateau, and South Asia, Central Asia and North Asia. A common denominator over this belt is the translocation of the Intertropical Convergence Zone (ITCZ) and the concomitant shift of monsoon rainfalls, ending up occasionally in deserti_cation.

The difficulties in the exploration of past human– climate interactions are typically highlighted in Chapter 14: " Looking to the future of research, it appears that addressing these difficulties will require not only an expansion of archaeological and paleoclimatic field and laboratory research, but also the development of new practical and theoretical approaches to the exploration of causality.

Whereas previous research has focused on abrupt events and the identification of chronological correlations between instances of climate and cultural change, it is becoming increasingly important to make use of methods that allow modelling of the links between climate change, resource variation, and processes of human demographic and socio-economic change" .

Finally, in the fourth section, the perspectives of technical and social adaptation are considered for the constraint of the anthropogenic environmental impact in the near future.

The initial proposal for this book was submitted to CRC Press in January 2017 and the final one in April 2017, following a review stage by five experts, whose recommendations are thankfully acknowledged.

The invited contributors were advised on the scope and the structure of the book and kindly and diligently responded in the dif_cult task of harmonizing their contributions in a co-ordinated reasoning. I_gratefully acknowledge their contributions and the pleasure of collaboration with distinguished scholars and researchers.

Dr. Marcia Glaze Wyatt's support is thankfully acknowledged for her encouragement and recommendations.

The top right picture on the cover, showing a hint of survival in the desertified savanna of the Tadrart Acacus Mountains, is thanks to the kind courtesy of Filippo Gallino, Savino di Lernia and the Archaeological Mission in the Sahara, Sapienza University of Rome.

The fruitful cooperation and guidance of the CRC Press staff is also acknowledged, particularly of Joseph Clements, Joette Lynch and Lisa Wilford, as well as the creative contribution by Lara Silva McDonnell in copy editing. Joseph Clements in particular is credited with the overall coordination and the compilation of the cover.

Eustathios D. Chiotis
Institute of Geology and Mineral Exploration of Greece

Please visit the site: https://www.taylorfrancis.com/books/9781351260237

ΕΙΔΗΣΕΙΣ - NEWS RELEASE

HARNESSED POMPEII HORSE

Pompeii horse found still wearing harnessThe remains of a horse still in its harness have been discovered at a villa outside the walls of Pompeii, in what archaeologists are hailing as a find of "rare importance".

The horse was saddled up and ready to go, possibly to help rescue Pompeians fleeing the AD79 eruption of Mount Vesuvius that buried the town in ashes.

It was found with the remains of other horses at the Villa of the Mysteries.

The villa belonged to a Roman general or high-ranking military magistrate.

Mount Vesuvius buried Pompeii and other nearby towns under millions of tonnes of volcanic debris.

Archaeologists at the luxurious Villa of Mysteries (Villa dei Misteri) overlooking the sea have already found wine presses, ovens and extraordinary frescoes.

The latest discovery came during an excavation of a stable at the villa to the north of Pompeii, according to Massimo Osanna, the director of Pompeii's archaeological park.

The apparently well-groomed horse, along with a saddle and a harness with fragments of wooden and bronze trimmings, was found alongside two other horses.

The horses had all come to a "fierce and terrible end", Mr Osanna said, suffocated by ashes or by the boiling vapours from Vesuvius's ash cloud.

The estate was originally dug up early in the 20th Century but much of it was reburied and has since been targeted by looters.

"The whole area will be excavated and returned to the public," said Mr Osanna.

Please visit the site: https://www.bbc.com/news/world-europe-46671050 [Go there for pix]

EXTREMELY IMPORTANT EARLY CHRISTIAN MONUMENT UNEARTHED ON WESTERN COASTLINE OF AKROTIRI PENINSULA

Cyprus Department of Antiquities, Ministry of Communications and Works announces the end of the 12th excavation season at the site of Katalymata ton Plakoton, which lies on the western coastline of the Akrotiri Peninsula.

The excavation is carried out under the supervision of Dr Eleni Procopiou, Senior Archaeological Officer assisted by seasonal employees (Demetriou Philippos, Theodoulou Theodoulos, Iakovides Linos, Fattas Christos, Philippou Serghios) and the support of the ass. Restorator Orphanou Christos. Mairy Chamberlain, Technician-Draughtswoman, is responsible for the final documentation of the finds. The excavation also runs as an educational centre for trainee archaeologists. Cypriots (Chatzinikoli Melpo MA Candidate of Ioannina University, Christodoulou Konstantinos, Archaeologist of the Aristotle University of Thessaloniki, Dr Panagiotes Panaghides, University of Athens and Salzburg), and British students participate, within the framework of the EU project Leonardo Da Vinci: GrEASE (Graduate European Archaeological Skills Exchange: Sian Bramble, University Central Lancashire UCLAN, Elizabeth Prosser, University of Reading, Jennifer Knight, University College London UCL, Emma Warner, University of Bournemouth, Lauren Priestley, University of Chester, Sarah Marshall, University of Wales Trinity St David, Victoria Schollar, University of Wales Trinity St David). The excavation is also supported by personnel of the Ministry of Defense of Great Britain under the Artemis Defence Archaeology Group of the Operation Nightingale venture, under Maj Michelle Richardson, Maj Wallace Harry, Sgt Griffiths Craig RLC, Sp Staff Lead & MHFA and LcPL Rose Kelly, (by three teams consisted by Sgt Hopkins Richard, AB Howley Jez, Bdr Ellis Steven, AB Pantry Robert, Pte Young Geoff, PO Wildish Claire, Pte Long Oliver, AB Pennington Emily, Mne Skipp Simon David, LCpl Golding Paul, SSgt McGregor Heather, Pte McCaughran Arianna, Reynolds Steven and Newbould Luke).

Excavations focused on the south wing of a huge complex, consisting of two monumental ecclesiastical structures to the west and east sides of an atrium, which measures 100 metres in length. Adjacent living spaces lie mainly along the south and the east, but have not yet been excavated. A second atrium was located and partially revealed to the north of Church B'.

The first church was explored between the years 2007-2010 and belongs to three-aisled transept basilica type, a variation of the cruciform type. It is 36 metres wide and 29 m. long, without the apse which protrudes to the west, which is part of a raised central platform. The building is paved with mosaic decoration preserved in very good condition.

During the 2018 season (figure 1), which focused on investigating the second church to the east, the cleaning of the south and central aisle was concluded, as well as part of the northern one. The central platform of the Holy Bema was also partially revealed, having

along its west side a lower level podium, the ambo, to which an axial corridor (solea) ends, indicating a highlighted Introitus rite of pre-sanctified Holy Gifts.

The above verify the initial assessments concerning the role of Church A' as a place for officiating pre-Introitus services and correlations with the ancient Liturgical Typika of Jerusalem and Alexandria (of St. Jacob and especially of St Marcus) have been confirmed. Church B' belongs to the semi-inscribed cruciform three aisled Basilica type, with an hexastyle propylon to the west, of a total length (including the propylon and the protruding eastern branch) of 46.47 meters and a width of 20 meters.

New mosaic panels were unearthed, including an inscription with the wish ΚΕ ΒΟΗΘΙ ΤΟΙΣ ΤΟ ΩΝΟΜΑ ΣΟΥ ΦΩΒΟΥΜΕΝΟΙΣ (My Lord help those who honor your name), as well as limestone and marble chancels from the Holy Bema, one of which is in marble and complete (figure 2).

The particular architectural form of the whole complex, as well as its decorative richness confirm that it can be considered as an exceptionally important monument of Christianity during the reign of the Emperor Heracleios, echoing in various ways the Persian invasions in the eastern Provinces of the empire, and the hospitality that the refugees, both clergy and lay people, received by the Amathusian Prelate of the Alexandrian seat, John the Almsgiver, during his forced return to Cyprus and before his departure on the 11th of November 619.

Please visit the site: https://www.tornosnews.gr/en/greek-news/culture/33772-extremely-important-early-christian-monument-unearthed-on-western-coastline-of-akrotiri-peninsula.html [Go there for pix]

DID THESE ANCIENT JUGLETS—FOUND IN A BRONZE AGE BURIAL IN ISRAEL—CONTAIN VANILLA? BY JASON DALEY

The finding suggests vanilla was being used 2,500 years earlier and half a world from where we thought, but vanilla experts are skeptical on the findings

Researchers have long believed that the first people to cultivate vanilla orchids were the indigenous Totonac people of Veracruz, Mexico, about 1,000 years ago, or perhaps even a little longer. They were conquered by the Aztecs, who learned to enjoy a dash of vanilla in their hot chocolate. The Spanish, it's believed, went on to import vanilla to Europe after conquering the Aztecs.

But a recent report based on a discovery from Megiddo, a Canaanite city and archaeological site in Israel, raises the possibility that vanilla may have been made 3,600 years ago in a totally different continent. The finding comes from residue analysis conducted on four juglets found in an untouched Bronze Age burial called "Tomb 50."
Bruce Bower at ScienceNews reports that the residue in the juglets contained vanillin and 4-hydroxybenzaldehyde, the major flavor components in vanilla, along with residue of olive oil and other biomarkers. The research was presented by doctoral candidate Vanessa Linares of Tel Aviv University at the annual meeting of the American Schools of Oriental Research.

While those compounds exist in other plants, Linares argues that only vanilla bean pods could have produced the amount found in the Bronze-Age Megiddo concoctions. "This is based on the profuse quantity of vanillin found in the juglets that could have only derived from the abundant amount of vanillin yield from the vanilla orchid pods," she writes in her abstract.

The claim of the flavoring in ancient Israel is a pretty non-routine one, and vanilla experts are skeptical. Ken Cameron, director of the Wisconsin State Herbarium at the University of Wisconsin, Madison, and author of Vanilla Orchids: Natural History and Cultivation, points out that there are a range of plants and chemical processes that produce 4-hydroxybenzaldehyde. "It is produced by many different plants and even results after the breakdown of other molecules such as lignin (wood). This is why some wines aged in oak barrels have a vanilla-like aroma," he writes in an email to Smithsonian.com. Calling attention to the residue of olive oil also discovered in the juglets, he writes, "Perhaps relevant to this story is the fact that olive oil contains vanillin… In my mind this would be a more logical source."

Linares expresses disappointment that the study has garnered so much attention before its official publication. The full study—including her data—is currently under review, and the analysis of vanillin and other biomarkers will appear in full when the paper is published. In short, she writes in an email to Smithsonian.com, the vanillin produced by the breakdown of lignin and other plant products only appears in trace amounts along with other biomarkers from the breakdown of wood or other plant material. In her analysis of the Megiddo juglets, however, vanillin appears in much higher concentrations

than expected from lignin or other non-vanilla plant products, and, in fact, is the primary biomarker found in the juglets, along with three to four other biomarkers associated with vanilla.
"Our analysis has excluded lignin, aromatic resins, and other various plants as possible sources based on the biomarker assemblage found in the Megiddo juglets," she writes.

She isn't claiming the Megiddo vanilla comes from some ancient unknown connection between the Canaanites and Mexico. The vanilla orchid family is quite large with more than 100 species spanning the globe in mostly tropical areas. According to Linares, it's possible that a vanilla species was being traded to the Middle East from East Africa, southeast Asia or India.

Cameron cautions against this interpretation as well, pointing out that while vanilla orchids from the New World form the aromatic pods that we use as vanilla flavoring today, Old World species don't develop the same fruit pods, and there's no evidence that these vanilla species were collected or cultivated for use before Spanish conquistadors introduced the spice. Dorian Fuller, an archaeobotanist at University College London, not involved in the research, tells Andrew Lawler at Science that he "would be cautious in attributing origins, given the lack of much ethnobotanical evidence for the use of native vanilla."

Linares' research only addresses what was found in the juglets—any evidence for an established vanilla trade network goes well beyond her study. Whether vanilla was traded in the ancient world or not, the occupants of the tomb where the juglets were found were the type of people who might enjoy such luxury goods. The burials included a man and woman and an 8- to-12-year-old boy, all of whom were decorated with gold and silver jewelry, an indication of their high-status position in Canaanite society. Six other bodies in the tomb found near the city gate were of lower-status individuals.

Researchers began an exhaustive investigation of the tomb last year, and that is one reason they analyzed the contents of the juglets. "The incredible state of preservation of Tomb 50 offers an important opportunity for comprehensive scientific study of the ancient population and their funerary practices," Melissa Cradic, the Megiddo excavations expert on Canaanite funeral practices, tells The Times of Israel. "We are studying diet and health, mobility and migration, ancient DNA, organic residues, environment, and issues of identity using the osteological and material remains."

In the meantime, until Linares data is published, we'll hold our judgement on the vanilla issue, unless the researchers dig up the smoking gun: a nice, crisp Bronze Age ice cream cone.

Editor's note, December 12, 2018: This story has been updated and revised to include comments from Vanessa Linares of Tel Aviv University and Ken Cameron, director of the Wisconsin State Herbarium at the University of Wisconsin, Madison.

Please visit the site: https://www.smithsonianmag.com/smart-news/was-vanilla-was-first-used-2500-years-earlier-and-half-world-where-we-thought-180970862/

SMALL OIL LAMP WICK FROM 1,500 YEARS AGO FOUND IN ANCIENT DESERT TOWN, BY RACHEL BERNSTEIN

A unique lamp wick dating to the Byzantine period has been uncovered, according to the Antiquities Authority on Monday, the final day of Hanukkah.

A unique lamp wick dating to the Byzantine period has been uncovered, according to the Antiquities Authority on Monday, the final day of Hanukkah.

Few lamp wicks have survived the 1,500 years since their last use since they usually disintegrate over time. The find at the ancient Negev town of Shivta is significant for archaeologists, who can then understand the wick's composition.

The wick was examined under the research project on Byzantine settlements in the Negev that has been conducted by the University of Haifa since 2015 and spearheaded by Prof. Guy Bar-Oz and Dr. Yotam Tepper. Tepper identified finds that had not yet been published from a previous excavation of the Negev site, when the American Colt expedition came to Shivta in the 1930s. Harris Dunscombe Colt carried out expeditions and excavations at various ancient sites in the Levant, and while his teams often uncovered great amounts of findings, they were rarely published thereafter.

The Antiquities Authorities laboratories then examined the wick itself, which was found in its holder. A small copper tube held the fibers, which were concluded by Dr. Naama Sukenik of the authority to be made of linen. The material was commonly used for textiles and clothing, as well as oil lamp wicks.

"It seems that this rare find was preserved thanks to the dry climate of the Negev," Sukenik said as part of the authority's statement on the find.

Oil lamps were regularly used in daily life, lighting up homes and public buildings. The lamps themselves were often made of pottery or glass, and while they are more frequently found in archaeological excavations, finding the wick itself is often not as easy. Because of the organic material of the linen, the fibers tend to disintegrate quickly.

"The Mishnah, tractate Shabbat, discusses what materials may and may not be used as wicks to light Sabbath lamps," Sukenik said. "There too, linen is mentioned as a high-quality material for wicks, because it burns long and beautifully. The Mishnah mentions other wicks, which were made of lesser quality materials and were therefore prohibited for use in Sabbath lamps. Among these were fibers made from the plant called Sodom's apple, which to this day grows in the Dead Sea area."

While Shivta's inhabitants were not likely to be Jewish, but rather Christian, the tractate's description of materials indicates what would have been commonly used, perhaps even during the Byzantine period.

The findings indicate that Shivta's population used linen wicks, despite that flax does not grow in the Negev. This would mean the wicks, or at the very least the linen itself, was imported from elsewhere, or farther north in the country. The wick's linen was not as of high quality as the linen that would be ideally used for garments.

Sukenik said that the wick likely accommodated a type of glass lamp that was typical of the Byzantine period, shaped as a glass cup or bowl filled with oil to provide light.

"Despite the tiny size of the wick from Shivta – only a few centimeters long – it sheds light on one of the most essential and common objects of antiquity, which has almost disappeared from the world, but survived at Shivta," Sukenik said.

The wick itself, along with other objects recovered from the Colt expedition at Shivta, will be on display at the Hecht Museum in Haifa, beginning January 24.

Earlier this year, a painting of what archaeologists believe to be a depiction of the face of a younger Jesus was discovered in the northern church of Shivta.

The discovery of the painting, along with the wick's analysis, are part of Bar-Oz and Tepper's work called "Crisis on the Margins of the Byzantine Empire," a bio-archaeological based project in the Negev.

The town of Shivta, also known as Subeita, is part of a series of Negev settlements which flourished economically and socially during the Roman and Byzantine periods. Originally believed to be stopping points for caravanserai of the Nabateans along the Incense Routes, the settlements were taken over by the Roman Empire in 106 CE, when the empire annexed the territory from the Nabatean Kingdom.

Since the Romans took over the region, the stopping points transformed into wealthy towns that contained numerous churches for its inhabitants and travelers, marking the highest point of Negev settlement until modern-day Israel.

Please visit the site: https://www.jpost.com/Israel-News/Small-oil-lamp-wick-from-1500-years-ago-found-in-ancient-desert-town-573962

HOW TO CRACK LONG-DEAD LANGUAGES, BY SOPHIE HARDACH

The key to cracking long-dead languages?
Tablets from some of the world's oldest civilisations hold rich details about life thousands of years ago, but few people today can read them. New technology is helping to unlock them.

Broken and scorched black by fire, the dense, wedge-shaped marks etched into the ancient clay tablets are only just visible under the soft light at the British Museum. These tiny signs are the remains of the world's oldest writing system: cuneiform.

Developed more than 5,000 years ago in Mesopotamia, the land between the Tigris and Euphrates rivers where modern-day Iraq now lies, cuneiform captured life in a complex and fascinating civilisation for some three millennia. From furious letters between warring royal siblings to rituals for soothing a fractious baby, the tablets offer a unique insight into a society at the dawn of history.

They chronicle the rise of fall of Akkad, Assyria and Babylonia, the world's first empires. An estimated half a million of them have been excavated, and more are still buried in the ground.

However, since cuneiform was first deciphered by scholars around 150 years ago, the script has only yielded its secrets to a small group of people who can read it. Some 90% of cuneiform texts remain untranslated.

That could change thanks to a very modern helper: machine translation.

"The influence that Mesopotamia has on our own culture is something that people don't know much about," says Émilie Pagé-Perron, a researcher in Assyriology at the University of Toronto. Mesopotamia gave us the wheel, astronomy, the 60-minute hour, maps, the story of the flood and the ark, and the first work of literature, the Epic of Gilgamesh. But its texts are mainly written in Sumerian and Akkadian, languages that relatively few scholars can read.

Pagé-Perron is coordinating a project to machine translate 69,000 Mesopotamian administrative records from the 21st Century BC. One of the aims is to open up the past to new research.

"We have information about so many different aspects of the lives of Mesopotamian people, and we can't really profit from the expertise of people in different fields like economics or politics, who if they had access to the sources, could help us tremendously to understand those societies better," says Pagé-Perron.

The kings of Assyria accumulated huge libraries of tablets carrying cuneiform scripts that are the last remaining link to languages that died out long ago (Credit: British Museum)

Apart from the clay tablets, there are also more than 50,000 Mesopotamian engraved seals scattered in collections around the world.
For millennia, the people of Mesopotamia used seals made of engraved stone that were pressed into wet clay to mark doors, jars, tablets and other objects. Only some 10% of these have even been catalogued, let alone translated.

"We have more sources from Mesopotamia than we have from Greece, Rome and ancient Egypt together," says Jacob Dahl, a professor of Assyriology at the University of Oxford. The challenge is finding enough people who can read them.

Pagé-Perron and her team are training algorithms on a sample of 4,000 ancient administrative texts from a digitised database. Each records transactions or deliveries of sheep, reed bundles or beer to a temple or an individual. Originally impressed into the clay with a reed stylus, the texts have already been transliterated into our alphabet by modern scholars. The Sumerian word for big, for example, can be written in cuneiform signs, or it can be written in our alphabet as "gal".

The wording in these administrative texts is simple: "11 nanny goats for the kitchen on the 15th day", for example. This makes them particularly suitable for automation. Once these algorithms have learned to translate the sample texts into English, they will then automatically translate the other transliterated tablets.

"The texts we're working on are not very interesting individually, but they're extremely interesting if you take them as groups of texts," says Pagé-Perron, who expects the English versions to be online within the next year. The records give us a picture of day to day life in ancient Mesopotamia, of power structures and trading networks, but also of other aspects of its social history, such as the role of female workers. Searchable translations would enable researchers from other areas to explore these rich facets of life in the ancient world.

"These people are so different and so remote from us, but at the same time, they have the same basic problems," explains Pagé-Perron.
"Understanding Mesopotamia is a way of understanding what it means to be human."

She hopes machine analysis will also clarify certain features of Sumerian that still puzzle modern academics. This extinct language is not related to any modern language but has been preserved in inscriptions written in cuneiform. It may be our last remaining link to even older, unrecorded societies.

"Sumerian is probably the last member of what must have been a large family of languages that goes back thousands and thousands of years," says Irving Finkel, the curator in charge of the 130,000 cuneiform tablets stored at the British Museum. "Writing appeared in the world just in time to rescue Sumerian… We're just lucky that we had some 'microphone' that picked it up before it went away with all the others."

Finkel is one of the world's leading cuneiform experts. In his book-filled office at the British Museum, he explains how the script was slowly deciphered thanks to a multi-lingual inscription about a king, just like the Rosetta Stone that helped researchers make sense of Egyptian hieroglyphs.

Algorithms trained to recognise cuneiform scripts are helping researchers to match tablets in collections around the world to the stone seals that made them (Credit: Jacob Dahl)

"It's actually rather astonishing how interesting it is when you find a human mind across millennia, where it is like talking to them on the telephone," he says. "It's the most exciting thing in the world when you meet one of these people."

Ancient access

Few of us will ever cradle a 5,000-year-old tablet in our palm. But thanks to advanced imaging techniques, anyone with an internet connection can now access treasures such as the world's oldest surviving royal library, which is being digitised. It was built in Nineveh by Ashurbanipal, a powerful and book-loving Assyrian king.

Some of the surviving tablets from his library are displayed at the British Museum as part of a special exhibition on Ashurbanipal.

Although blackened and hardened by fire when Nineveh was sacked in 612 BC, the text they carry can still be read.

New imaging techniques are making the job of working with such ancient, often damaged texts easier. With highly detailed images, it is possible to pick out marks that may be too obscure to see with a human eye.

Dahl and his colleagues have been digitising tablets and seals stored in collections in Teheran, Paris and Oxford for a project known as the Cuneiform Digital Library Initiative. This vast online database already contains about a third of the world's cuneiform texts, as well as some undeciphered written languages, such as Proto-Elamite from ancient Iran. Without sprawling digital resources like this, training machines to do translation would not even be possible.

New imaging techniques, combined with advanced machine vision tools, are helping to transform efforts to decipher ancient languages like Proto-Elamite (Credit: Jacob Dahl)

Digitisation is also helping researchers to piece together links between texts scattered in collections around the world. Dahl, along with researchers at the University of Southampton and the University of Paris-Nanterre, has digitised 3D images of about 2,000 stone seals from Mesopotamia. In a pilot project, they then used AI algorithms to examine a group of six tablets and identify matching seal impressions found elsewhere in the world. The algorithm correctly selected a tablet that is currently stored in Italy, and another that is stored in the United States; both had been stamped by the same seal.

Matching seals and impressions has been notoriously difficult in the past, as many are stored thousands of miles apart. Dahl estimates that all seals could be digitised within about five years, which would then make it possible to trace other patterns. There is some indication, for example, that certain types of stone were favoured by women.

"That is the kind of question you could not answer unless you had large numbers of seals imaged in the way we're doing, and applying techniques like algorithms or machine learning," Dahl says. He hopes that as artificial intelligence evolves, it will help us unravel the full potential of the rich information contained in collections around the world.

"I want Assyriology, which covers half of human history and a very endangered cultural heritage, to be at the forefront of this."

Cracking codes

Imaging is also changing research into undeciphered scripts. Humans tend to be better than machines at this type of decipherment, which typically involves small amounts of text, creative mental leaps, and an understanding of how people lived and organised themselves. It also involves a great deal of intellectual flexibility.

Three dimensional imaging techiques are allowing cylindrical seals like the Lapis Lazuli seal to be examined in unprecidented detail

Early cuneiform signs, for example, were not even arranged in a linear text, but simply placed together with a box drawn around them.
Proto-Elamite is three-dimensional: a shallow impression of a circle has a different meaning than a deeper one. However, technology has helped the decipherment process by providing detailed pictures that can be magnified, shared and compared.

"The crucial problem is first and foremost to get proper images," says Dahl, who is working on deciphering the mysterious script. "That's lacking for the first 100 years of study of Proto-Elamite."

Such advances go beyond the field of Assyriology. Philippa Steele, a senior research fellow at Cambridge University, is an expert in the early writing systems of ancient Crete and Greece. These include 'Linear A', an undeciphered script, and 'Linear B', which was used to write an ancient form of Greek.

Thanks to techniques that take sophisticated images of ancient tablets that feature these scripts, Steele has discovered new details.

"You can make out features that are very difficult to make out with the naked eye," she says. "And often those features might correspond to the ways in which the person writing the document interacted with the document. So for Linear B, for example… you can make out erasures.
Sometimes you can tell when the person writing the document has worked something out and then written something over the top."

Archaeologists in Iraq have unearthed thousands of tablets containing some of the world's earliest written languages (Credit: The Trustees of the British Museum)

Pagé-Perron hopes that machines will eventually be able to translate more complex Sumerian tablets, and other languages like Akkadian.
"There's a lot more to discover about ancient cultures," she says.

Perhaps one day, we will be able to read all of our earliest texts in translation – though many of Mesopotamia's riddles are likely to outlive us, not least because many missing cuneiform fragments are still in the ground, waiting to be excavated.

The kings of ancient Mesopotamia thought deeply about the past and the future. They revered cuneiform texts from previous eras, and buried special inscriptions recording their names and achievements, promising rewards for a later ruler who would honour them.

In some ways their wish came true. Their battles and conquests may be forgotten by most. But their most powerful invention, writing, has helped humanity develop ideas and technologies over millennia – and now, train machines to learn from the past.

Please visit the site: http://www.bbc.com/future/story/20181207-how-ai-could-help-us-with-ancient-languages-like-sumerian