COPROLITE

No. 103 Winter 2022

Coprolite is the newsletter of the Geological Curators' Group, compiled and produced by Lu Allington-Jones, Senior Conservator at the Natural History Museum, London. Contributions from everyone are welcomed, and should be sent to the Newsletter Editor (coprolite@geocurator.org) by the appropriate deadline:

Spring edition issued in March - Deadline 15th February. Summer edition issued in June - Deadline 15th May. Autumn edition issued in September - Deadline 15th August. Winter edition issued in December - Deadline 15th November.

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Please log into our website and check that your contact details and preferences are correct and check whether you need to pay your subs (due from January 1st).

@OriginalGCG https://www.facebook.com/GeologicalCuratorsGroup www.geocurator.org

Events

Webinars

SedsOnline is an online webinar series sponsored by the International Association of Sedimentologists. They have a webinar every Wednesday at 4pm BST, as well as regular communal Coffee Breaks. https://sedsonline.com/events/

The Natural History Museum's Nature Live Online is continuing with its lunchtime webinars, frequently on geological topics, every Tuesday and Thursday. https://www.nhm.ac.uk/visit/whats-on.html

Conferences and Events

The Volcanic and Magmatic Studies Group Annual Conferencewill be held in London, 4th – 6th January 2023. Registration closes 12th December 2022. https://vmsg.org.uk/events/meetings/

The Geological Society is hosting a two day conference in 2023 called Sea level change in the past, present and future. It's due to take place as a hybrid conference – both at Burlington House and online, 6th – 7th February 2023. Abstract submission and registration are via their website.

The Petroleum Exploration Society of Great Britain (PESGB) and the Geological Society are launching a new major conference series entitled the Energy Geoscience Conference (EGC). "The series will disseminate high-quality, energy-related geoscience to a UK and global audience via a physical and virtual conference every six years, with the proceedings published by the Society's Publishing House. The first conference – EGC1 – is scheduled for 16th – 18th May 2023 in Aberdeen, UK". https://geoscientist.online/sections/news/the-energy-geoscience-conference-series/

The 2023 Marine Reptile Conference will now take place in person. Please check their webpage for announcements. http://www.marinereptiles.org/

The Society for the Preservation of Natural History Collection (SPNHC) next year will be the 38th Annual Meeting and will take place in San Francisco, California, from 28th May – 2nd June 2023. Please see their website for more details: Abstract submission will close 9th January 2023. https://www.calacademy.org/spnhc-2023

Many thanks to Emma Nicholls, GCG Blog Editor, for collating this information.

The GCG 49th Winter Seminar and AGM

The GCG 49th AGM was held virtually on 1st December, in association with The Society of Mineral Museum Professionals (SMMP) http://www.smmp.net/

The theme of the symposium was Uniting Earth Science Collections. Twelve presentations and six posters were shared on a range of topics from exhibitions to sampling, and digitisation to historical collections.

Please see the GCG website for the annual report, minutes and more information.

Members will soon also be able to view recordings of the presentations.

Welcome to several people who have changed roles or joined the Committee:

Trustee roles
Chair, Emma Nicholls
Secretary, Lu Allington-Jones
Communications Coordinator, Juned Zariwala
Journal Editor, Duncan Murdock
Program Coordinator, Mark Evans

Non-trustee roles
Newsletter Editor, Cinzia Ragni
Blog Editor, Rob Theodore
Associate Editor (journal): microfossils and geoheritage, Jessica McCoy
Associate Editor (journal): fossil vertebrates, Neil Adams
Associate Editor (journal): conservation and preparation, Lu Allington-Jones

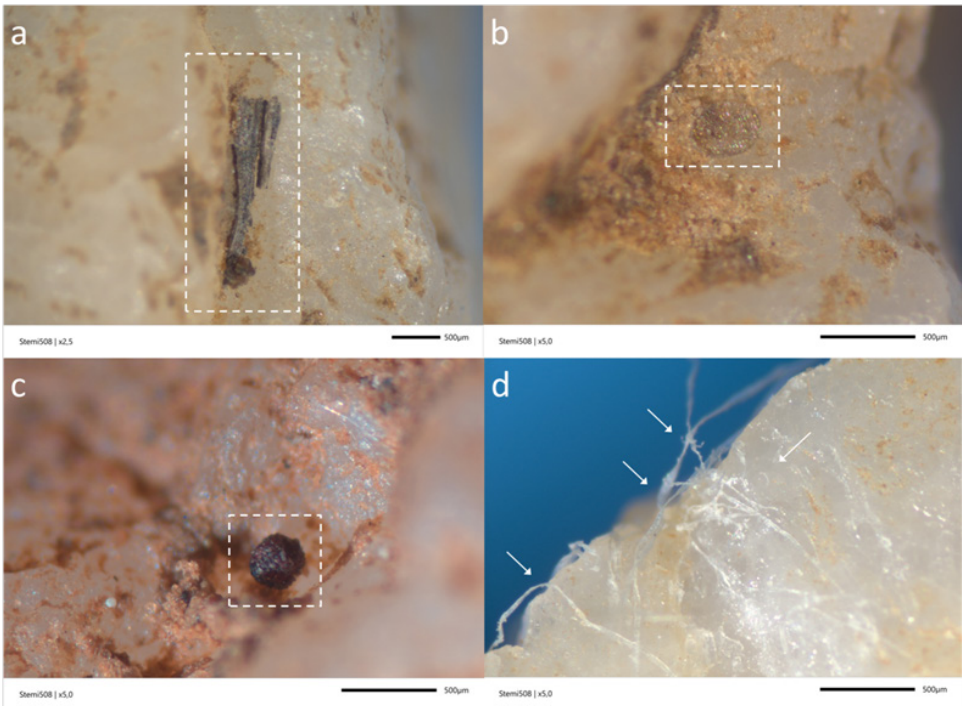
We are still seeking a volunteer Web Assistant to join the team. Please see this page for more details.

News Features

A Hidden Microcosmos

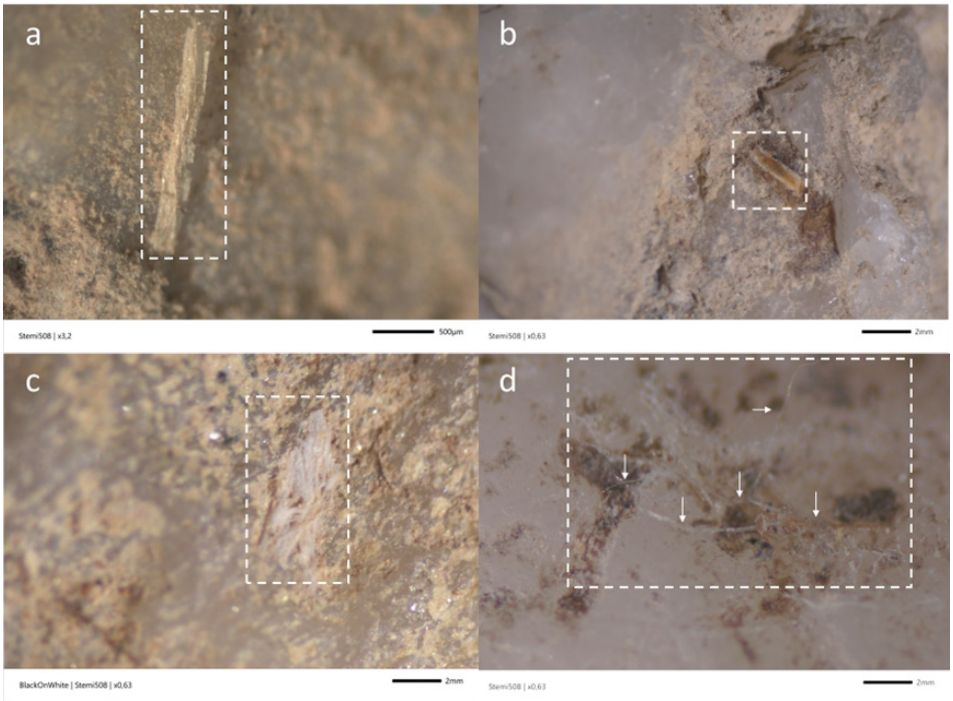
Quartz is one of the most abundant minerals on Earth. In archaeological literature, the term "quartz" usually refers to its macrocrystalline variety: automorphic quartz (rock crystal) and or xenomorphic quartz (vein quartz). Characteristics such as its hardness, mechanical and physical properties, its brightness and pale colouration favored its use in the Pleistocene and Holocene lithic technologies. Although it is one of the main raw materials used from the Paleolithic until the Bronze Age, quartz studies have had a late development due to the difficulty in the recognition of the knapping traces. This feature introduces my research project "Quartz in prehistoric societies of Greece from the Paleolithic to the Mycenaean Age: uses and interpretations" which focuses on quartz use in Greek prehistory including seven archaeological sites dating to Paleolithic, Neolithic and Bronze Age.

To gain a better understanding, all the quartz implements were examined under the stereomicroscope. Low-power optical microscopy opened a new domain to the research. A great number of artifacts preserve a variety of micro-residues: the minute remains that are adhered to an artifact. Quartz assemblages that have remained unwashed after the excavation especially offer a unique opportunity. During all the procedures within the project, handling was minimal and always undertaken with sterile powder-free gloves, and cleaning was minimised to a gentle rinse with water. All of the artefacts were studied using a low-power optical microscopy approach using a stereo microscope with a magnification range of 10-30x. The micro-residues were photographed with a Levenhuk DTX 90 USB digital microscope equipped with a 5 Mpx camera and magnification within the 10x-300x range. They were documented according to their characteristics (colour, structure, position, distribution, and possible co-occurrence of use-wear on tools). Small-scale blind tests with experimental samples were also analyzed in the same way. This research pipeline (which is still in progress) resulted in the identification of a variety of archaeological organic and inorganic micro-residues: microfossils, fibers, particles, pigments, traces and amorphous residues of plant, animal, and mineral origin (Fig. 1). Alongside contaminant residues other features were identified to have been caused by taphonomic conditions, such as organic-rich deposits, or post-excavation treatments, such as ink and nail varnish from labeling, or remnants of adhesives.



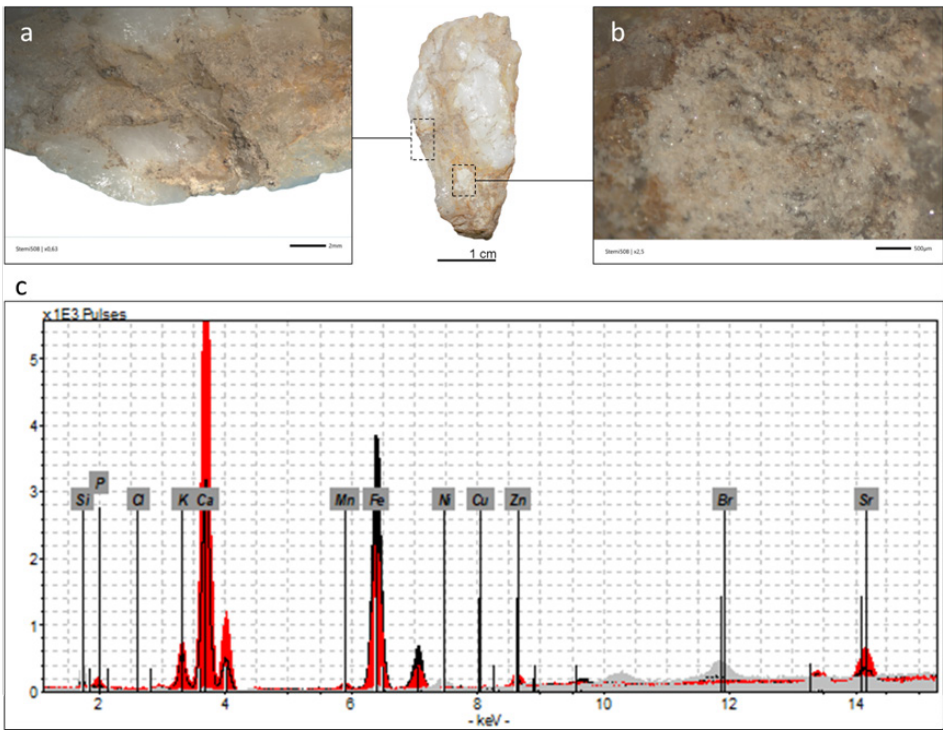
Above: Archaeological micro-residues: (a) glume base (grass husk fragment), (b) phytolith, (c) seed, (d) animal hair.

At the moment the most advanced research is being undertaken at Thessaloniki Toumba - an imposing artificial hill, with thirteen habitation phases from the late 3rd millennium (Early Bronze Age) to the late 4th century B.C.E. A total of 714 quartz artifacts from Bronze Age building M were documented. A total of 221 (30,9%) quartz tools preserve possible micro-residues. A selected sample of 33 quartz tools was additionally observed under a ZEISS Stemi 508 stereo microscope with 8:1 Zoom and magnification within the 0,63x-50x range, equipped with a USB microscope Jenoptik Gryphax® camera. An ARTAX 400 – Bruker AXS was used for the implementation of the non-destructive micro-EDXRF spectrometry technique at the Laboratory of Conservation, Chemical-Physical analysis and Archaeometry, at the Archaeological Museum of Thessaloniki. Spectra were obtained both from residue substances and from the quartz clear substrate.



Above: Thessaloniki Toumba: (a) plant tissue, (b-c) traheids, (d) animal hair.

Small scale blind tests with experimental samples were also analyzed with micro-EDXRF creating a comparative reference dataset. Interpretations were suggested on the basis of comparison residues-substratum spectra results and available literature discussing archaeological as well as experimental residues. The results were also compared to stratigraphic information. Morphological examination revealed plant material (fibers, tissues, phytolithes) and animal (hair) remains (Fig. 2). Among the 33 samples analyzed by micro-EDXRF, 16 presented an elemental analysis different from that of the substrate (Fig. 3). The observed high presence of Fe in two samples is associated to colourants. Higher concentrations of Ca and P are related to bone remains. Strong appearance of Ca could be connected to sea shells, while when Ca co-occurred with Br is an indicator of the Muricidae family. These results are in agreement with previous studies placing multiple workshop activities at building M. The ongoing research will be further developed with SEM-EDS and FTIR analysis, to inspect the organic structure of residues, and improve identification confidence. The same procedure will be operated on selected samples from all the archaeological sites under study. The aim is to reveal possible technological or behavioral inquiries from the different uses of quartz prehistoric chipped stone tools and shed light on the "life history" of the artifacts from their use in prehistoric times to their treatment as museum objects.



Left: Thessaloniki Toumba - quartz tool KE7729. (a-b) Optical microscopy images. (c) EDXRF spectrum showing the presence of Ca, Fe, K, P and Mn, possibly related to bone. Red colour represents residue b. Black colour represents residue a. Grey colour represents quartz substratum.

This project was presented in a poster session at the 7th Symposium Archaeological Research & New Technologies (ARCH_RNT) 6-8 October 2022, Archaeometry Laboratory-Univercity of Peloponnese, Kalamata, Greece.

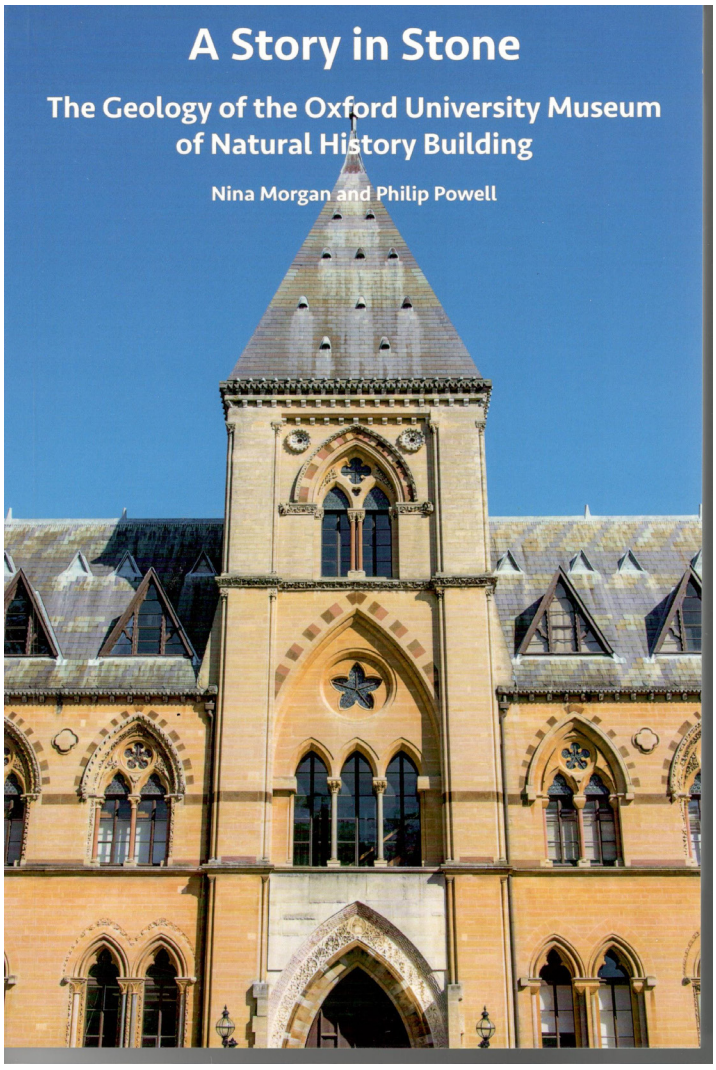
by **Ourania Palli**, Ph.D. Candidate, Department of History and Archaeology, National and Kapodistian University of Athens; Archaeologist, Department of Exhibitions, Communication & Education, Archaeological Museum of Thessaloniki. opalli@culture.gr

A Story in Stone

The Oxford University Museum of Natural History (OUMNH) is now celebrated as one of the most important Gothic revival buildings of the 19th century. The stated object of the building was to teach science. Its design was based on the idea that "no ornament should be employed which had no significance with reference to the object of the building."

Geology played an important role in achieving this goal. The 127 polished stone columns, composed of a wide range of British and Irish stones and topped by carved capitals representing botanical specimens, are among the most striking features of the Museum interior – and in geological terms the most instructive. But there are also many other geological features to explore.

Our new book, *A Story in Stone: The Geology of the Oxford University Museum of Natural History Building*, focuses on the geology on show throughout this iconic building, and provides an introduction to geology and the history of the Museum that anyone can enjoy. For more information visit www.gravestonegeology.uk



by Nina Morgan
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Coprolite of the Quarter

Answer to last quarter's mystery coprolite:

Stratigraphy:
Rhaetic Bone Bed (Triassic)

Location:
Westbury-on-Severn, Gloucester-shire, UK

Image courtesy of:
Nigel Larkin

Last quarter's winner:

Congratulations to Gerald Lucy.

Guess the Coprolite

Please send guesses about this sectioned and polished coprolite to:
coprolite@geocurator.org

The answer and winner will be announced in the next quarterly newsletter. The winner will also receive a small prize.
If there are several correct answers, one winner will be selected at random.

https://www.geocurator.org/coprolite