

Early limb amputation in Borneo

Archaeologists working in a remote part of Indonesian Borneo have discovered a human skeleton that appears to offer the earliest known evidence of a surgical limb amputation.

The fossilised remains, which date to between 31,000 and 30,000 years ago, were found during excavations at Liang Tebo, a site in East Kalimantan, in 2020. The individual, who is of indeterminate sex and was aged 19-20 at the time of death, is missing the lower part of their left leg. Recent analysis indicates that it was surgically amputated during childhood. The clean cut, which severed both tibia and fibula, matches the pattern of a surgical amputation rather than an accidental injury, while the ends of the remaining leg bones display a bony growth of the type seen in modern amputation cases.

Although we do not know exactly how the amputation would have been carried out, it is clear that the 'surgeon' responsible must have had an advanced knowledge of human anatomy and complex medical techniques in order to remove the limb without fatal blood loss or infection. In fact, not only did the individual survive the amputation itself, they went on to live for another 6-9 years. This indicates that they must have received considerable care from their community, both to nurse them through the immediate aftermath of the surgery, and to help them survive with reduced mobility in the mountainous region in which they lived.

Examples of early medical interventions are known from other prehistoric sites, but until now it was commonly believed that complex surgeries like this were beyond the abilities of hunter-gatherer communities. Previously, the earliest known evidence of surgical amputation came from a farmer in France c.7,000 years ago, supporting the assumption that advanced medical expertise developed around the time of the Neolithic Revolution, c.12,000 years ago. The new discovery from Liang Tebo suggests that this is not the case, and that the ability to perform complex medical procedures developed much earlier in Island Southeast Asia. The researchers highlight that these abilities may have been present in other



LEFT Analysis of the remains of an individual who lived c.31,000 years ago has indicated that the lower part of their left leg was surgically amputated; a discovery that could change our understanding of human medical history forever.

areas of the world as well, although no evidence has yet been uncovered, but that it is also possible that Borneo's rainforests were home to people with an exceptional level of medical expertise in the Late Pleistocene, perhaps due to both the increased risk of infections and the wealth of plants with medicinal properties found in this tropical climate. It is also unknown whether the surgical skills seen at Liang Tebo were standard across the region at this time, or if this case is a rare exception. Nevertheless, the discovery offers a unique insight into a community with advanced medical knowledge long before the advent of farming, which could have dramatic consequences for our understanding of the history of healthcare.

The research has now been published in *Nature* (<https://doi.org/10.1038/s41586-022-05160-8>).

BELOW The skeleton was found in Liang Tebo cave, in a remote region of Indonesian Borneo.



IMAGES: Tim Maloney

MAYA CACAO CONSUMPTION



ABOVE Many of the sherds that were analysed tested positive for theophylline, revealing that the use of cacao was much more widespread among Maya society than previously believed.

It has long been believed that the use of the cacao tree (*Theobroma cacao*), from which chocolate is made, was controlled by the elites of ancient Maya society, but new research suggests that this was not the case. Previous studies looking at evidence for Maya cacao usage have largely focused on highly decorative types of vessels from elite ceremonial contexts, and have therefore supported the assumption that access to cacao was restricted to the powerful and wealthy. However, the recent study by researchers from the University of California, Santa Barbara, set out to explore the extent to which cacao was used in wider Maya society.

The team analysed ceramics from a variety of contexts from El Pilar, an important Maya centre in the Late Classic period (AD 600-900), on the border of modern Belize and Guatemala. The pottery sherds were subjected to laser mass spectrometry in order to identify the biomarker of theophylline, which signifies the presence of cacao. The analysis found traces of cacao in 56% of the sherds; not just in the drinking vessels, as might be expected, but in storage jars, mixing bowls, and serving plates as well. The study also revealed that cacao consumption was taking place in all sorts of contexts, in residential units as well as civic centres, and both near and far from Maya centres, indicating that it was much more widespread than previously assumed. The researchers stress that the fact that cacao appears to have been generally available does not diminish its value, but rather suggests that its importance for the Maya people extended throughout society, and was shared by everyone from the farmers growing the plant to the royalty with whom it has traditionally been associated.

The study has been published in the journal *PNAS* (<https://doi.org/10.1073/pnas.2121821119>).

IMAGE: ISBER/MesoAmerican Research Center

NEWS IN BRIEF

EGYPTIAN CHEESE

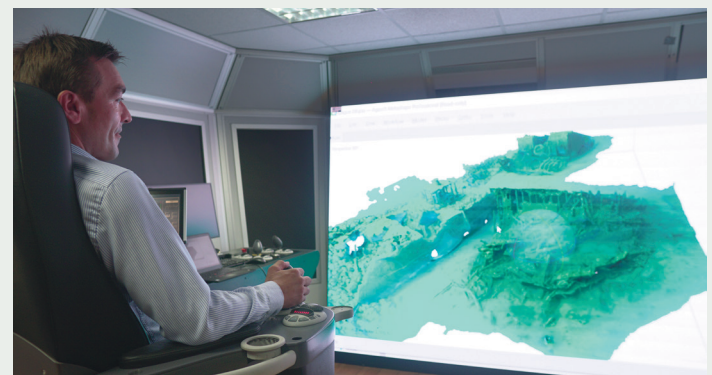
Excavations at the ancient Egyptian necropolis of Saqqara have uncovered the remains of 2,600-year-old cheese. The blocks of white cheese were discovered in several pottery vessels inscribed with Demotic script, dating to the 26th or 27th Dynasty (668-525 BC). According to Dr Mostafa Waziri, the secretary-general of the Supreme Council of Antiquities of Egypt, this type of cheese was called 'haram' by the ancient Egyptians and became known as 'halloumi' in the Coptic period (4th-7th centuries AD). Today, we know this squeaky cheese, made from a mixture of goat's and sheep's milk, as halloumi. Archaeologists also uncovered several more containers in the same area, which have yet to be opened. This find comes after the discovery of what may be the world's oldest solid cheese, dating to over 3,200 years ago, in another tomb at Saqqara in 2018.

ANCIENT OCTOPUS LURES

Analysis of artefacts found in the Mariana Islands, in western Micronesia, has identified them as the oldest known octopus lures in the world. The objects are made of cowrie shells – a type of sea snail favoured by octopuses – and are believed to have been attached to a stone sinker and hook by a fibre cord and used to attract and capture octopuses. Examples of these lures found at seven sites on the islands of Tinian and Saipan have now been radiocarbon dated to between 1,500 BC and 500 BC. No older examples have currently been found anywhere else, and their presence in the Mariana Islands at this early date offers an important source of information about the development of fishing practices and ancient diets in the Pacific. The study has been published in *World Archaeology* (<https://doi.org/10.1080/00438243.2021.1930134>).

MONTENEGRO LAUNCHES MARITIME ARCHAEOLOGY UNIT

Montenegro is one of several countries bordering the Adriatic Sea, which is home to many shipwrecks and underwater heritage sites. But unlike its neighbours, Montenegro has never had a dedicated underwater archaeology institution – until now. The country's first maritime archaeology research unit, the Laboratory of Maritime Archaeology, has been established at the University of Montenegro, within the Centre for Research, Innovation and Entrepreneurship of the Faculty of Maritime Studies in Kotor. The Laboratory's mission is to foster research in maritime archaeology and support the protection of Montenegro's underwater cultural heritage, as well as making it more accessible to the public through the use of innovative research methods and state-of-the-art technology. The Laboratory was formed as a result of the Wrecks4All project, which aims to promote tourism based on the underwater cultural heritage of the eastern Adriatic region.



TEXT: Amy Brunskill IMAGE: Laboratory of Maritime Archaeology