

How Archaeology Can Inform a More Resilient Future

At the 2023 AIUla World Archaeology Summit, hundreds of interdisciplinary experts explored the subject of resilience in the ever-changing modern world—and underscored the value that archaeology can provide in helping guide a more sustainable future

In the contemporary world, humanity is standing upon a precipice: the challenges wrought by global issues like climate change are forcing communities worldwide to dramatically reconsider their ways of life. And while modern innovations and technologies are offering up novel solutions to these challenges, the past is also a robust source of insights into how to tackle the challenges of the day.

Understanding and interpreting the lessons of our ancestors—their achievements, their failures, their values and ways of life—has long been a preoccupation of those whose work is absorbed in the past: historians, archaeologists, anthropologists, archivists, and others have always advocated for humanity to heed the wisdom of previous generations and civilisations. During the first AIUla World Archaeology Summit, archaeologists and cross-disciplinary experts gathered in AIUla, Saudi Arabia, to discuss a wide range of topics related to the present and future of the field. Among these discussions, the theme of resilience took centre stage. The UN defines resilience as the ability to adapt and respond efficiently and effectively to a wide range of risks, without compromising long-term prospects for sustainable development, peace and security, human rights, and wellbeing for all. In the context of this framework, participants posed and addressed many questions related to the topic of resilience: how can archaeology serve the modern world? How can archaeological inquiries and findings be leveraged to address contemporary issues and challenges? How can archaeology provide added value to society? And how can archaeologists help strike a balance between heritage preservation and sustainable development?

In many ways, the challenges that archaeology can be leveraged to address are the same challenges that often threaten archaeological and cultural heritage sites. During her keynote address at the summit, Dr. Jyoti Hosagrahar, Deputy Director of the UNESCO World Heritage Center, noted a number of issues that are posing significant threats to archaeological sites worldwide, including rapid urbanisation, environmental degradation, climate change, natural disasters, and over-tourism. The summit, she explained, provided leaders in the field with “an opportunity to exchange and discuss matters related to archaeological advancement and the important role that archaeology can play not only for research and knowledge, but in relation to societies.” In the days that followed, summit participants delved deeply into numerous ways in which the inquiries and findings of archaeologists can inform the modern world’s responses to contemporary challenges—all of which underscored the vital importance of protecting and preserving cultural heritage worldwide.

Urban Planning and Sustainable Architectural Practices

In the modern world, urbanisation and cultural preservation are often locked in a tense and contentious battle: after all, land is a finite resource. This problem, of course, is far from a new one: cities tend to be built atop cities, with each successive civilisation building upon the ruins of the previous civilisation. But in the modern era, as population growth continues to propel urban expansion, the need to build continues to grow.

Professor Assad Seif from the Lebanese University has experienced this battle between building and preserving first-hand: after the Lebanese Civil War, he was involved heavily in efforts to rebuild Beirut. “For more than 10 years,” he explained, “we had two camps: the archaeologists who wanted to preserve and the developers who wanted to develop.” Part of his task was to strike the balance between these two camps, integrating the city’s heritage into the calls to redevelop for future generations.

Of course, archaeology has much more to offer the modern world than the preservation of the past, and in the case of urban planning and construction, archaeologists are deriving many insights from their inquiries into the building practices of past civilisations.

For example, archaeologists and other interdisciplinary experts in Saudi Arabia are deriving incredible lessons and learnings about sustainable building practices from their inquiries into the Old Town of AlUla. The first historical mention of the settlement dates back to the 12th century CE, and it was continuously occupied until the early 1980s, AlUla’s Old Town offers an extraordinary lens into how traditional architectural practices can provide instructive lessons for the modern world. The entire town comprises a hive-like series of side-by-side houses and alleyways constructed out of mudbrick, usually on top of stone walls at ground-storey level. Some stone block fragments were potentially sourced from deeper building levels, either here or from nearby heritage sites; ancient Dadanitic inscriptions are occasionally juxtaposed within the mudbrick walls.

The process of building, rebuilding, and fortifying the houses and city walls that extend into the oasis was a continuous one—a tradition that endured across many centuries. Rain and other forms of erosion would wash layers of the mudbrick down into the valley below the town, where it would pool and accumulate. Residents would then collect this mud runoff and combine it with other materials, including palm fronds and bark—completing a fermentation process, before working together to use this recycled mud to build the walls and roofs of the city and its houses. This process is an incredible demonstration of the circular, sustainable nature of earthen architecture.

AlUla’s mudbrick-laden Old Town is but one example of earthen architecture: around the world, archaeologists and other experts are looking closely at how traditional building practices and sustainable building materials can be leveraged in modern construction and development. During a panel discussion at the summit, Sophia Malik—an Engineer, Architectural Designer, and Founder of Heritage Not Inherited—spoke of her organisation’s efforts to reincorporate bamboo into modern building practices, as a replacement for manmade materials. “It’s not applicable all over the world,” she explained, “but where it grows naturally—in places like Peru, Brazil, and any dry or tropical climate, it’s very practical. It grows so quickly, and if you treat it well, it can last up to 30 or 50 years. And it’s very easy to construct, and can easily fit into existing structures.” She elaborated that because of its growth speed and its strength-to-weight ratio, bamboo is more environmentally friendly than most modern building materials. In addition to cutting down on carbon emissions when compared to materials like concrete, which accounts for roughly eight per cent of CO2 emissions worldwide, bamboo actively captures CO2 in its poles.

UNESCO has identified earthen architecture as a particularly vital component of global heritage—and one that is especially susceptible to risks. As of 2011, more than 10 percent of World Heritage properties incorporated earthen structures, and of the World Heritage Sites currently

listed as 'in danger,' roughly one-fourth of them are earthen sites. UNESCO has put added focus on the importance of the protection and conservation of these kinds of heritage sites, noting that the lessons and learnings derived from them bear great potential when it comes to alleviating poverty and promoting sustainable development. When properly maintained, earthen architecture is in fact very durable. Reviving and applying local techniques in earthen building is therefore key to both preserving heritage structures and advancing the use of these materials in modern constructions.

Agriculture and Water Management

While agriculture is essential to the survival and prosperity of modern human societies, it also happens to pose significant threats to cultural heritage sites around the world. With a growing population, the demand for food continues to increase. In his work as the Co-founder of the Endangered Archaeology in the Middle East and North Africa project, the University of Oxford's Dr. Robert Bewley found that "agriculture is the biggest threat to archaeological resources outside the cities—because there are more people who need more water and food." Professor Dominic Powlesland, Director of the Landscape Research Centre in Yorkshire, affirmed this statement with his own experiences and findings, noting that, while working on an area of vast archaeological interest, he came up against one of Great Britain's largest commercial potato producers. "The growth of crops was catastrophic," he said. "We would lose 15 centimetres of archaeology in a field in one year."

Of course, many of the threats that agriculture poses to archaeological heritage relate directly to contemporary, industrial agricultural practices—which are far from the kinds of agriculture that were practised by past societies and civilisations. Today, archaeologists around the world are delving deeper into the lessons that can be derived from ancient agricultural practices.

When looking at the agricultural practices of the past, water management inevitably comes to the forefront of the discussion. And at a time when water management is among the most critical climate change-related issues facing much of the world, archaeological inquiries into ancient water management practices are enlightening and reframing how we approach this in the modern era.

While discussing the potential applications of ancient wisdom for modern challenges, Pietro Laureano—architect, town planner, and CEO of IPOGEA—shared several case studies from around the world that demonstrate how ancient techniques can still be used today to transport and deliver water without depleting resources. "Matera, in southern Italy, seems like a medieval city," he explained, "but it has a series of caves that use a geothermal system and passive architecture for irrigation and water supply."

Meanwhile, Durham University Professor Derek Kenet challenged the assumption that ancient wisdom has inherent superiority when solving modern problems, arguing that the practices of ancient civilisations are considerably less relevant in the context of the contemporary world: "One big advantage they had in the past was low populations. The level of productivity that we must achieve in agriculture [today] is so much higher. So the question I have to ask is, 'Can [these ancient techniques] do the job?'" In response to this challenge, Professor José María Martín Civantos from the University of Granada's Biocultural Archaeology Laboratory argued that a

broader definition of productivity is necessary. “The concept of efficiency that we use is quite narrow,” he explained. “It’s linked to productivism and extractivism. But if we think of efficiency as being linked to multifunctional ecosystems, to sustainability and resilience, traditional and historical irrigation systems become very efficient.” In other words, by making resilience one of the key measures of success across various industries—as opposed to prioritising productivity as the primary success measure—the lessons of the past become increasingly relevant.

All across the county of AlUla, there are myriad examples of the ingenuity of ancient water management systems. The Nabataeans, for example, were renowned across the ancient world for their ability to access, manage, direct, and store water in arid climates. At Hegra alone, archaeologists have been able to analyse several of the different methodologies and practices used by the Nabataeans. They have uncovered more than 130 wells dug across the site, the largest of which measures around seven metres in diameter and 17 metres deep. The Nabataeans also collected rainwater through a series of reservoirs and cisterns carved into the large sandstone outcrops that are such iconic fixtures of the landscape.

Studying water management practices in oases like AlUla and neighbouring Tayma and Khaybar can be especially useful when trying to derive insights that may be applied to modern water scarcity challenges. Here, experts have been studying ancient qanat systems, which allowed residents of the AlUla oasis to cleverly manage the distribution of water using a series of underground channels that tapped into the aquifer below; a series of water gates were then constructed—both at the points where the underground channels meet the surface and throughout the series of channels that runs at ground level—which could be opened or closed according to a predetermined schedule. Even today, these underground systems are widely regarded as a brilliant feat of engineering, offering many insights into how water can be intelligently and sustainably controlled. Beyond their technological ingenuity, these systems also demonstrate the important role that community cooperation plays in the resilient management of finite resources. By focusing on fair, equitable access as a priority, experts and authorities can more readily overcome one of the key challenges related to modern water management: exploitation of and inequitable access to water sources and reserves.

But the insights derived from past achievements are not the only ones of value: looking at past societies’ mismanagement and misuse of resources like water can also provide instructive lessons on how to move forward: in oases where the water table has been heavily depleted, archaeologists and other experts can delve into the habits and practices that ultimately led to this depletion—which can then inform a more sustainable way forward. In AlUla, a multi-disciplinary project under the scope of the French Agency for AlUla Development (AFALULA) has been investigating the local groundwater management and uses in the past, as well as hydrology and soil archives, in order to gain a better understanding of the historic reserves and how renewable (or non-renewable) these reserves are—which is deepening our contemporary understanding of what sustainable water management practices might realistically look like within the local context.

Public Health and Medicinal Practices

There's no denying that the modern world has presented us with an array of particularly modern health-related issues and challenges—and it can be tempting to turn exclusively to modern medicine to address these challenges. But once again, the wisdom of ancient civilisations and societies can offer incredible insights that may be applied to addressing contemporary public health challenges.

Perhaps one of the greatest ways in which archaeology is contributing to our understanding of public health is by challenging traditional notions and conventional wisdom about the health, wellness, and longevity of our ancestors. During a discussion about archaeological perspectives on public health at the summit, an archaeologist described their work excavating 7,000- to 8,000-year-old Neolithic sites along the coast of Abu Dhabi: "Our previous thoughts about Neolithic people were that they lived to an average age of about 35 or 40 years old. But last summer, we excavated a new site—a grave site—dating to around 6000 BCE, and we were shocked to find the burial of a woman who was between 50 and 60 years old. This is a very good age for someone living in that time period and, in terms of public health, it tells us that ... when the community was looking after someone, they could survive to that age."

This idea of community care being an important indicator of health and longevity is something that has been observed in both ancient and contemporary societies around the world—and could have major implications on how health care professionals tackle wellbeing in modern societies. During the same discussion, a bioarchaeologist and Egyptologist spoke about her work at the Deir El-Medina site in Egypt: "We sometimes find these very paradoxical health outcomes, where communities that we expect to not do well are actually thriving—and I think this is often actually not about medicine, but about community care." Building on this observation, she posed an important question: "What are we not integrating into modern health care that we have lots of evidence for in our more distant past, that we should be better at?"

Observations from the past can even be applied to public health crises like the recent COVID-19 pandemic. An archaeologist, who had spent time excavating plague burials in Venice, Italy, relayed his experiences and observations: "The Venetians were quite savvy in working out, quite quickly, that if you isolated people who are sick in an area where they can't spread it further, eventually you have a general populace that's less likely to be infected. And it was, in effect, one of the first regions in Europe that was free of the plague." The implications of observations like these on modern public health are clear. As the same speaker observed, when communicable illnesses like COVID-19 pose a threat, "one of the things you need to do in the immediate short-term is to lock down people, stop people moving and stop it spreading as best as you can."

Archaeological inquiries can also help us better understand how to strike a balance between modern and traditional medical practices and wisdom. Two representatives from the Natural History Museum of Abu Dhabi highlighted how their work in archaeobotany is helping to provide insights into the value of traditional medicines. As one of them explained, "More research will help

doctors, and thus it's very important to have reference collections. In Abu Dhabi, we have the Zayed Complex for Herbal Research and Traditional Medicine." His colleague added that, through her role, "I look at the plants that are left at archaeological sites and I try to interpret what they ate and what they used as medicine."

Another participant in the discussion underscored the need for more modern research and inquiries into traditional medicinal practices: "It's why we shouldn't destroy the Amazon rainforest—because of the plants that haven't yet been studied or identified, which can heal, which can help benefit modern medicine." Increasingly, modern health challenges are pushing healthcare practitioners and researchers to reconsider the wisdom offered by traditional and herbal medicinal practices—and archaeologists often hold the key to these age-old insights.

Climate Change and the Comprehensive Regeneration of Global Ecosystems

While the scale of climate change in the modern world is truly unprecedented, requiring urgent global action and intervention, it is far from the only time in history that human societies have confronted the ever-evolving realities of an ever-changing world. The nature of archaeology lends itself to focusing heavily on how ancient civilisations rose and fell, and how ancient towns, cities, and sites went from bustling epicentres to abandoned ruins. In many instances, climate change and natural disasters were the culprits that ultimately led to the abandonment of these sites. As Dr. Pierre Zalloua, Professor at Abu Dhabi's Khalifa University, explained, "You can see [the effects of climate change] in the submerged landscapes that were once on dry land. And I'd not be surprised if we find a lot more that is buried under the sea." Today, much of the work being done by archaeologists—and maritime archaeologists in particular—must ultimately confront the possibility that many of our modern habitats could one day face a similar fate. And looking at the fates of these past civilisations can provide clues on how to confront climate change and the rapid degradation of natural ecosystems around the world.

In recent decades, archaeologists across the globe have begun to make concerted inquiries into the scale and impact of anthropocentric climate change. This ultimately means prioritising climate-related inquiries above others. "We're never going to be able to dig it all up," Professor Powlesland explained during the summit. "Ultimately, we have to decide what is going to enlighten, inform us, and allow us to do our job better." Given the urgency of the current global climate change crisis, many archaeologists have decided to prioritise climate-related research.

In AIUla, archaeologists are working within multidisciplinary teams of biologists, agronomists, hydrologists, conservationists, historians, anthropologists, and community members to pursue a novel approach to reviving the local ecosystem—one that is quickly becoming a model for the rest of the world. Through the concept of 'comprehensive regeneration,' a diverse array of stakeholders are working to restore the natural landscape to its peak state within living

memory—roughly a century ago. The approach also aims to revive AIUla’s agricultural sector, which means that experts are helping empower local farmers and community members to reinstitute pre-modern farming practices. With the aid of modern resources and innovation, sustainable farming practices are being reintroduced throughout the oasis.

At its core, the idea of comprehensive regeneration is built upon a deep respect for the local landscape, culture, and heritage—and that includes the restoration and preservation of archaeological heritage sites. Established on the principles of a circular economy, this approach pays reverence to the ways in which natural ecosystems and human ecosystems are intricately intertwined. And at the centre of it all, archaeology is playing a crucial role in providing solutions to contemporary challenges, leveraging the insights of the past to pave a path forward.

During the 2023 AIUla World Archaeology Summit, IPOGEA CEO Pietro Laureano emphasised the importance of striking a balance between past, present, and future. “It’s not about reusing ancient technology,” he said. “It’s about creating new technologies that are not invasive, thanks to ancient knowledge.” This message was echoed across countless discussions and conversations at the summit, underscoring the importance of finding equilibrium between heritage and progress: rather than viewing the past and future in a dichotomous manner, archaeologists are demonstrating how heritage and progress can harmoniously coexist—and how the former can help propel and inspire the latter. In AIUla, this approach is taking on new life—and actively confronting some of the greater challenges of the day, in order to work toward a more sustainable, resilient future.