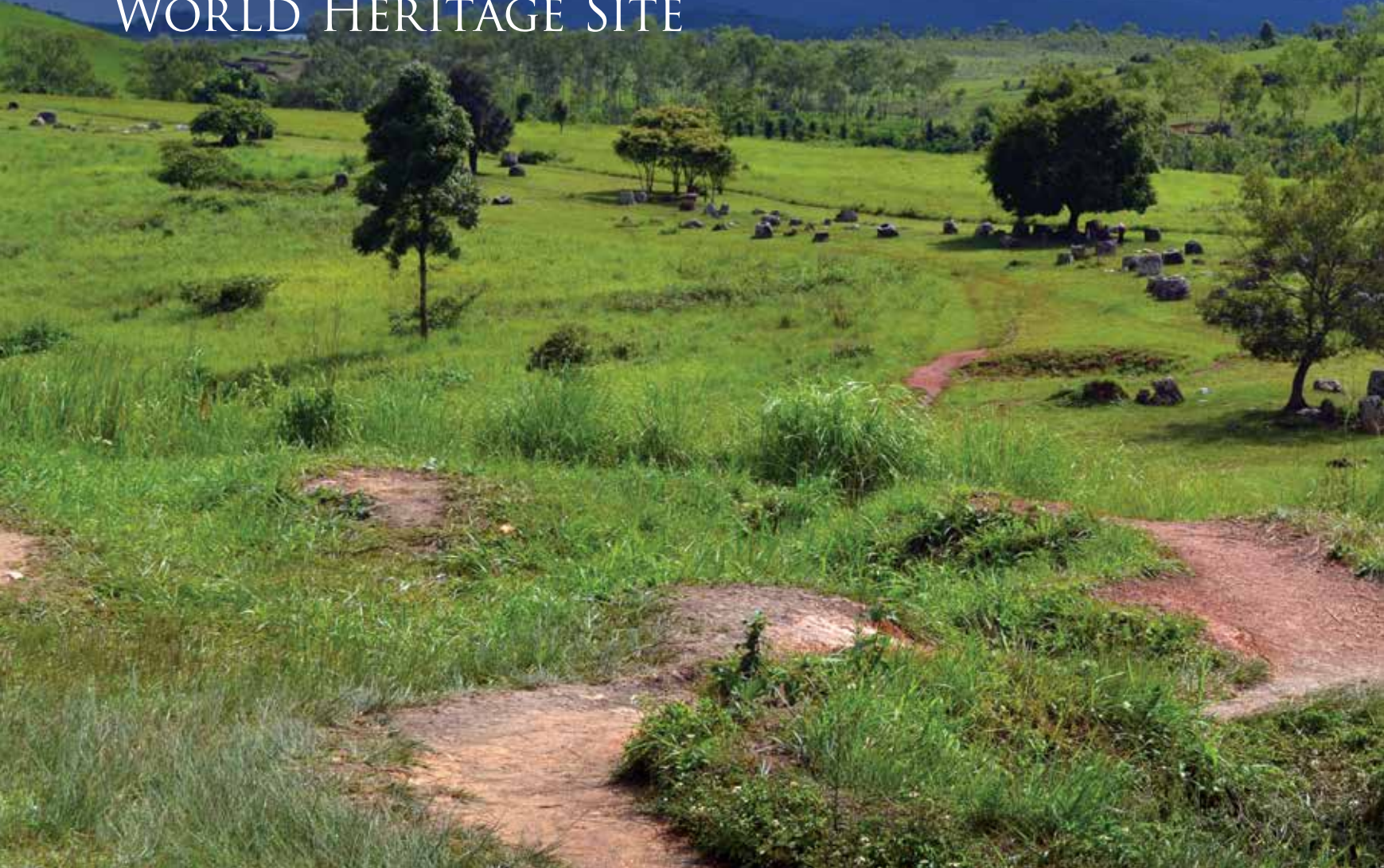


Plain of Jars

RESEARCHING A NEWLY INSCRIBED
WORLD HERITAGE SITE



Clusters of massive stone jars in Laos have inspired considerable curiosity. Little is known about the people who fashioned them, while even the date they were created has not been conclusively resolved. **Louise Shewan, Dougal O'Reilly,** and **Thonglith Luangkhoth** explain what research is revealing about these mysterious megaliths.

The breathtaking, mountainous, and forested landscape of northern Laos conceals one of South-east Asia's most mysterious and least understood archaeological cultures, known primarily for the massive stone jars they left behind. The megalithic jar sites of Laos comprise 1m- to 3m-tall

carved stone jars scattered across the landscape, appearing alone or in clusters of up to several hundred. To date, it has been thought they are related to the funerary rituals of an elusive, powerful, and expansive group that existed during the Iron Age (c.500 BC-AD 500) – a dynamic period with evidence for increasing social and political complexity.

The sites were brought to the attention of Western scholars by visitors and surveyors from as early as the late 1800s.

Significant research commenced with the pioneering expeditions by Madeleine Colani (1866-1943), a formidable French geologist and archaeologist from the *École Française d'Extrême-Orient*. Colani excavated at



ABOVE Numerous sets of massive stone jars have been discovered in Laos. The most-famous site is at Ban Hai Hin, where the jar placements include this set (Group 2), which was arranged in a crescent shape around a cave. Numerous questions remain, such as when the megaliths were positioned and who the people were that created them.

the now-famous site of Ban Ang (today known as Ban Hai Hin, and Site 1) and documented some 20 other sites in the region. Her work uncovered human skeletal remains and artefacts including ceramic vessels, stone and glass beads, spindle whorls, iron implements, bronze jewellery, ceramic ear-discs, and ground-stone objects. In some cases, human bone



and glass beads were reportedly found inside the jars, but they were otherwise empty. Since Colani's missions and impressive subsequent two-volume publication, archaeological excavation and research has been limited, due in part to the unexploded military ordnance contaminating the region (see www.uxolao.org/en), a tragic legacy of the Vietnam War.

Work resumed in the 1990s, conducted by Eiji Nitta and Thongsay Sayavongkhamdy. This resulted in the recovery of similar material culture to that reported by Colani, but it was also observed that chipped stone pavements surrounded the stone jars and, in some instances, buried limestone slabs mark the location of primary and secondary burials, while boulders marked the location of burial jars. A series of radiocarbon dates were also produced, which ranged widely from 7552 BC to AD 1214. Following this research, UNESCO-supported surveys in the 2000s – undertaken by a team led by Julie Van Den Bergh and Samlane Luangaphay – resulted in the creation of a detailed database of 58 GPS-located jar sites, complete with jar group numbers, and a list of an additional 26 unexplored

sites. Since then, the number of recorded sites has steadily increased as a result of more recent survey and excavation. The total now stands at over 100 sites, with many more likely to exist, concealed by dense forest. In July 2019, UNESCO recognised the significance of these remarkable relics, when it added the Plain of Jars to its list of World Heritage Sites.

The jars of Laos are not the only such megalithic receptacles known in the wider region. Seemingly comparable examples are found in Assam, in North-east India, where both the geography and environment are strikingly similar to those of upland Laos. Another intriguing example of megalithic jars occurs in Central Sulawesi, in Indonesia, where large stone vats called *kalambas* bear some resemblance to the jars of Laos.

Return to Ban Ang

In 2016, an international Lao–Australian team conducted excavation and survey at Ban Hai Hin (Site 1), creating a detailed inventory of the stone jars, burial-marker boulders, and sandstone discs. Each megalith was accurately geolocated, while their appearance and state of preservation were carefully registered ▶



LEFT Madeleine Colani (1866-1943), an archaeologist from the École Française d'Extrême-Orient who excavated at Ban Ang and documented some 20 other sites in the region on her pioneering expeditions.

position of buried ceramic funerary jars.

We opened three trenches around the Group 2 jars, which revealed the remains of at least 18 individuals, who were found in a variety of settings. Most individuals proved to be secondary burials, which could take the form of disarticulated bundles of bone or remains placed in ceramic vessels. For the first time, though, we also found what seems to be a primary extended burial, on the basis that the skeleton was completely articulated. More than 60% of the deceased were infants and children, almost half of whom died at the foetal stage or in early infancy. Extrapolating from this suggests that the area immediately around the Site 1 megaliths could, potentially, contain the remains of more than 8,000 individuals. Isotope analysis is now under way to investigate how these people lived and what sort of diet they enjoyed. These results will also be compared to baseline environmental isotopic data to explore where the interred individuals may have spent their childhoods.

Radiocarbon dating of charcoal samples produced dates spanning 8200 BC to AD 1200, with the majority suggesting that activity around the Group 2 jars occurred

PHOTO: EFO

to aid ongoing conservation measures. Site 1 is dominated by a limestone cave that Colani suggested functioned as a crematorium. The mouth of the cave faces over 316 stone jars, arranged in five groups. A small hill to the north is home to the largest and most-impressive jars, which are known as Group 1. The most-numerous set (Group 2) lies at a lower elevation, and was arranged in a crescent in front of the cave mouth. Three smaller groups of jars to the south make up the remainder of the site, bringing it to nearly 30ha in extent. Interspersed among the jars were more than 20 sandstone discs. Although these are often thought to be the jar lids, this interpretation is questionable, as there are many more jars than discs, and the discs have also been found to mark burial places. In addition, there were 308 boulders that are natural, but exotic – meaning they do not naturally occur at the site – all of which were captured with drone-acquired imagery. As noted, the boulders appear to be tombstones of sorts, heralding the

STRONTIUM-ISOTOPE ANALYSIS

Strontium-isotope ratios ($^{87}\text{Sr}/^{86}\text{Sr}$) are routinely used in archaeological studies to investigate the mobility patterns and exploitation strategies of past populations. $^{87}\text{Sr}/^{86}\text{Sr}$ ratios serve as 'geochemical signatures' that are ultimately produced by the local bedrock and vary according to its age and composition, meaning that different geology produces different readings. This signature enters the soil via weathering, where it is taken up by plants, before being absorbed into the teeth and bones of animals and humans, through food and water intake. Dental enamel is the preferred material for strontium-isotope investigations, as it is largely resistant to contamination and, unlike bone, which continuously remodels, preserves the isotopic signature of the local environment at the time when the tooth developed in childhood and does not change. On the right, we can see the authors retrieving teeth from under a disc at Ban Hai Hin.



RIGHT Among the Ban Hai Hin jars, the cluster known as Group 1, on a low hill, are the largest and most impressive.

between the 9th and 13th centuries AD, making it considerably more recent than the Iron Age dates previously reported for the site. However, only one of these dates (AD 1163-1125) was produced by material retrieved from beneath a jar, so further evidence is needed to confirm their exact date of placement, as the burial activity is not necessarily contemporary with when the jars were installed. Currently, a programme is under way to secure further radiocarbon and optically stimulated luminescence (OSL) dates from sediments sealed beneath the jars, to try to pin down when they were positioned.

Another vexing issue is how such massive megaliths, some weighing in excess of 30 tonnes, were transported from their quarry across the rolling landscape. A soon-to-be-published geochronological study of



jars from Site 1 has confirmed that they probably came from a quarry at Phukeng, some 8km away. This raises several, as-yet unanswered questions related to the method of megalith movement. Possibilities include the completed vessels being hauled from the quarry using a rolling pulley system or perhaps drawn by elephants or buffalo, but whatever the solution, or solutions, manoeuvring the megaliths was clearly a significant logistical and organisational undertaking.

Despite the fame of Ban Hai Hin, it is unusual among the jar sites in Xieng

Khouang province, because most jars were placed not on the plain, but at higher altitudes perched on ridges and hill slopes. Prior to 2017, none of these had been extensively investigated. With this in mind, the research team focused its attention to the north-east of Site 1, on a remote, mountainous region. This is home to Site 52, which is situated at a height >

BELOW Excavations under way among the Group 2 jars at Ban Hai Hin. Work revealed a number of burials (INSET), emphasising the mortuary nature of the site.



CAVE2 IMMERSIVE-VISUALISATION PLATFORM

Modern interactive technology is being deployed to collate, archive, and communicate our research findings from the Plain of Jars. A virtual reality (VR) archaeological landscape has been created in Monash University's CAVE2 facility. The CAVE2 system comprises 80 high-definition 3D displays, arranged in a 7.6m-diameter cylindrical layout, with an advanced motion-capture tracking system for VR exploration of data. With the ability to interrogate multiple datasets – such as drone imagery, information from ground-penetrating radar (GPR), and photogrammetry models – simultaneously, we are able to recreate the excavation for further exploration within an interactive, collaborative environment, and to disseminate our results.



of about 1,300m near a Hmong village, in rugged and forested terrain. Some 415 jars, along with 219 discs and boulders, are laid out in six discrete groups among the trees and thick undergrowth. Several of the discs are decorated with carved zoomorphic figures.

Our aim was to collect data from Site 52 that could be compared to Site 1. To that end, eight areas were selected for excavation based on the presence of jars, discs, and boulders. The excavations revealed significantly less material culture than was encountered at Site 1 and – aside from a single tooth – no skeletal material. Despite the sparsity of artefacts, features such as the presence of sandstone chip pavements and exotic limestone blocks were closely comparable to elements associated with burials at Site 1. As the absence of human bone at Site 52 could be explained by it being eaten away by the acidic soil, it seems

reasonable to suggest that the site was also mortuary in nature.

While the team was working at the site, local villagers alerted us to several unrecorded jar sites nearby. Reaching them was not straightforward, but slashing through the thick forest with machetes revealed several jars that had only been partially completed, suggesting they were either quarry sites or places where jars had been abandoned during transit.

Digging Ban Nakho

In early 2019, the team returned to the central Plain of Jars to undertake research at Ban Nakho, known as Site 2. This is located about 12km from Site 1 and comprises two jar groups, which are set on a hill with expansive views of rice paddies and distant mountains. Like many other such sites, this location was the scene of heavy fighting and, according to local inhabitant and former combatant

Mr Sivonh, a US bomber dropped several large bombs on Site 2 in the late 1960s, the craters of which are still clearly visible.

Site 2 contains 86 jars and 15 discs, with some of the latter featuring decorative concentric circles and anthropomorphic figures, while one of the jars also appears to have a human figure carved on it. A curious characteristic is that the discs were frequently placed so that the decorative side lies buried. Three areas were identified for excavation, which were selected on the basis of an anomaly identified during a ground-penetrating radar survey, as well as various surface features, including jars, discs, and an unaltered sandstone boulder. In addition, we opened smaller test-pits to take a look underneath several of the carved discs found at the site.

Although burials were once again absent, artefacts discovered during the excavation were similar to those from the other jar sites, including stone beads, ground stone tools, a chlorite pendant, bronze bell fragments, an iron knife, and ceramic vessels. One ceramic jar was of particular interest for combining both freehand incised decoration and impressed chevron designs. This type of vessel had not been previously encountered, as most of the pots found at the jar sites are low-fired earthenware, whereas this was a wheel-made jar fired at a high temperature. It is currently undergoing reconstruction and examination by South-east Asian ceramic specialists.

It is also evident that many more jar groups exist in the area. Surveys conducted last year by team-members Souliya Bounxayhip and Nicholas Skopal identified some 25 previously



LEFT Site 52, on a misty morning. It lies in a remote upland region, a setting more representative of the majority of the Laos jar placements than those at Ban Hai Hin.



ABOVE The jars at Ban Nakho lie on a hill about 12km from those at Ban Hai Hin. Some of the 15 discs at Ban Nakho feature decorative circles or figures.

unrecorded sites. Of particular interest was the discovery of several sites where the megalithic jars were buried up to their rims. Although buried jars have previously been reported, the new discoveries indicate the practice was more widespread than previously suspected, while also hinting that there may be further sites that are still unknown, even to locals.

As we prepare for future work, we have time to reflect on what has been learnt to date, what questions remain, and our new directions for research. The sites explored so far appear to be funerary in nature, but the Plain of Jars is not surrendering its secrets easily. While Sites 2 and 52 lack the extensive skeletal remains encountered at Site 1, items discovered in association with them and therefore indicating that burials were once present have been found at the other locations. Even so, it remains to be determined whether the jars date to the same period as the burials surrounding them, and if these interred individuals are related to those who carved the jars. Just as importantly, where did these people live? So far, we have only identified one potential settlement site, leaving the creators of these jars and those responsible for the burials something of a mystery. Another pressing unanswered question is how widely spread this culture was, and how these sites relate to the similar megaliths in Assam and Sulawesi. The

possibility of a link is of great interest, and efforts are now under way both to extend our research in Laos and to examine these potential wider connections.

The jar sites of Laos clearly have enduring ritual significance and inspire fascination for the mysterious Xieng Khouang culture that created them. These mesmerising megalithic sites continue to excite curiosity and it is entirely appropriate that they have been granted World Heritage status. ▣

BELOW One unusual find from Site 2 was this sizable vessel, which features both decoration and a production method that stands out as unusual among the pots most often found associated with the jars.



FURTHER READING

- L Shewan and D O'Reilly (eds) (2019) *Madeleine Colani's Megaliths of Upper Laos*, London: Barcaray International Publishing.
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- D O'Reilly, L Shewan, M Khamphouong, and A Butphachit (2020) 'Research at megalithic jar site 52 and the discovery of new jar sites in Xieng Khouang Province, Laos', *Asian Archaeology* 3: 21-33.

FURTHER INFORMATION

The Plain of Jars (Lao PDR) was inscribed on the UNESCO World Heritage List in July 2019, following more than a decade of assiduous and dedicated effort by the Lao Department of Heritage (Ministry of Information, Culture, and Tourism) and other stakeholders, supported by various collaborative research endeavours. One such research initiative is our ongoing joint Lao–Australian archaeological programme, launched in 2016 and funded by the Australian Research Council.