Field Report SUNDASIA Project 22nd August - 11th September 2016

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Four objectives were submitted originally for this season of work. As presented to the Trang An Management Board (and published on the SUNDASIA website) these were as follows: Firstly, to carry out a **geophysical survey** using ground-penetrating radar (GPR) at a dozen cave sites within the interior and around the periphery of the Tràng An massif, providing a valuable guide to our excavation strategy during this season and beyond. Secondly, conduct an initial survey into the modern-day **biodiversity** of Tràng An in association with the Oxford University Museum of Natural History (OUMNH) and local expertise within the Tràng An Management Board. Extending our understanding of the landscape's current biodiversity will create important points of comparison to the prehistoric character of the massif, particularly with respect to tracking habitat and species change or resilience through time. Thirdly, we intended to conduct **test excavations** with UK-Vietnamese teams at two groups of cave sites located close to the perimeter of the massif. Data arising from this work was intended to expand and complement the existing archaeological record from the interior of the massif. Finally, and working with the Ninh Binh People's Committee, the Tràng An Management Board, and other colleagues we aimed to lay the ground-work for **forthcoming project work-packages**, as well as develop the public profile of the project in Vietnam with local media. Progress was made towards each of these objectives during the course of the season. Each is dealt with in turn.

Objective 1: Geophysical survey

By the conclusion of the season ground-penetrating radar surveys had been conducted at five sites (Hang Hanh, Hang Ang Noi, Thunh Binh 1, Hang Trong and the Temple rock-shelter). This included two sites that had been excavated ahead of the Trang An World Heritage nomination (Hang Ang Noi and Thunh Binh 1), one that had been previously excavated by the Trang An Archaeological Project (Hang Trong) and two new sites (Hang Hanh and the Temple rock-shelter). The results of the geophysical work are presented as **Annex 1** to this report. Although there was some variation in the nature of sub-surface deposits between surveyed sites (e.g. dense clay at Hang Ang Noi compared to shell midden at Hang Trong), in each case the data obtained has advanced our understanding of the sites investigated archaeologically this season and in terms of sites and areas of excavation to be prioritised by the project in the future.

Objective 2: Biodiversity

The scheduled biodiversity survey was led by Darren Mann (Head of Life Collections at the OUMNH) and took place between 27th August and 1st September. This work involved using light traps to attract insect life at night, as well as the setting of baited overnight traps in two areas of the core property (Hoa Lu Ancient Forest and Tam Coc), and daily traverses within the core (Tran Temple to Hang Boi) and buffer (in the area around the Bai Dinh hotel and the Thunh Binh caves) zones of the property to produce and initial assessment of the insect fauna present. Full details on this work are forthcoming, but indications are that the diversity of insect life (and by extrapolation, larger wild fauna) is significantly greater in the

core zone than in the buffer zone of the property – a demonstration that the buffer zone is working. While we are mindful that sampling was limited to a 24 hour interval, the likelihood that the core zone remains home to larger game animals, such as monkeys, civets and mustelids (badgers), was on this occasion not supported. These animals may be absent from the park as the beetles and other invertebrate fauna that live off their dung were not identified. While this does not mean that larger animals are wholly absent (e.g. a hog badger was seen near the Tran Temple in 2014), it does imply that they are probably only present at comparatively low levels at the present time. Moving forward, one initiative that might be considered is to ensure 'habitat corridors', perhaps from Cuc Phong, which could encourage a bolstering of the local animal population within the Trang An core zone. It was also apparent, even from a cursory study of the samples collected, that some of the specimens will either extend the range of known insect species in Vietnam, or may even reveal species within the Trang An property that are new to Science. Further work in this part of the project is envisaged and recommended.

Objective 3: Archaeological excavation

Weather conditions have been such during this trip that we have had to adjust our initial archaeological schedule – ensuring that access to site and the integrity of excavated trenches and the safety of project staff were taken into appropriate consideration. As a result, while we had intended to begin our archaeological work at Hang Hanh – this site was scanned with the GPR equipment during the first afternoon of the field season with this intention – inclement weather and (ironically) the intensity of the heat on-site when it wasn't raining due to reflection off the cliff wall behind the site (in excess of 37°C) forced a re-assessment. Two other nearby sites (Hang Van and Hang Ma Vai) proved inaccessible because of high water levels, so we turned our full attention in the first instance to **Hang Ang Noi**. Being a cave and one readily accessible from the road, this gave us greater certainty of access and protection against changeable conditions. Excavations at Hang Ang Noi were carried out between 25th August and 5th September, beginning with a GPR scan of the site, survey planning of its dimensions and key features. Drawing on the results of the GPR work, we initiated further excavation in a trench (Trench 1) already opened by Vietnamese colleagues in 2012 ahead of the World Heritage nomination. Over the period of work at this site we opened three further trenches (Trench 3 – within an area of apparent midden accumulation adjacent to the southern wall of the cave; Trench 4 just to the southeast of Trench 1 and excavated into silty layers that contained large quantities of micro-fauna (bird, bat, rodent and amphibian remains; and Trench 5 at the back of the cave. Each of these was initially 1 x 2 m in size, Trench 3 was extended to 3 m^2 as we sought to understand the complex and disturbed deposits we were finding here from multiple cultures and time periods.

None of our new trenches at Hang Ang Noi yielded abundant cultural remains, though the complicated Trench 3 proved to be the most productive. This trench was an enigma. The very rocky surface and hints of ash/charcoal concentrations we found here when we began to clear the trench surface, quickly gave way to much greater charcoal concentrations (notably in square 615/201) and the merging ashy areas across that square. Some of this might be the result of material dropping from an overhanging ledge from 'recent' incense burning, but the presence of 13th century polished ware, together with (and for us perhaps more significantly) several fragments of Da But corded ware suggest that the cave has been visited over an extended period of time.

Interestingly, we also found fragments of Da But among small rocks on the ground surface adjacent to Trench 3 and on the far side of the cave next to the north wall (associated there with a small patch of shells). Our current working hypothesis for the formation of the deposits in Trench 3 is tentative but may be summarised as follows.

Episodic high velocity short duration water action within the cave has had the effect of preventing the accumulation of) significant depths of silty (guano-rich) deposit on top of what appears to be thick dense clay (revealed most evidently in Trench 1). At present a 'fresh' silty-guano surface layer in forming at the back of the cave, which we touched in Trench 4) and may be visible in section in a localised an area of ash and burning at the very top of the Trench 1 sequence (west-facing section). The probability of higher water action in the cave in the past was hinted at both through the recovery of noticeably rounded and abraded small rocks in Trench 5 and in the same trench by an area of flowstone, and the probability of a sink-hole to the north of Trench 5 – though the extent to which these lines of evidence relate particularly to periodic high velocity events is unclear at this time. In addition to scouring the accumulated loose surface sediment, these hypothesised hydrological events may also have promoted the movement of smaller stones to the periphery of the cave (e.g. into the vicinity of Trench 3) and with them any surface fragments of pottery or shell that may have accumulated in the intervening time since the previous such event – leaving some 'islands' in parts of the cave where the water action did not touch or move patches material (see above remarks about surface finds of Da But). Notably, some Da But ceramic sherds were abraded, potentially in-keeping with exposure to water movement. A combination of cultural material falling between rocks in the Trench 3 area and possibly some turning of the loose rocks and sediment by water action might account for the mixed character of the sequence we were excavating here. The charcoal and burning context (A202) within square 615/201, we suspect may be the result of a secondary or later event (or events) and is perhaps not intrinsically related to the various pieces/periods of pottery found near and within it. Mr Linh added that the later period pottery at least is clearly domestic ware, and not the kind of vessels that would have been used for offerings; something that may further distanced these two depositional processes from one another.

Perhaps the greatest point of significance for Hang Ang Noi, in terms of the ambitions of the SUNDASIA project was the identification (not previously made) that groups using Da But pottery had visited this site, with attendant components of that culture (e.g. marine shells and crab) present if not necessarily in clear association. The Da But has now been recovered from three cave sites in Trang An (Hang Boi, Hang Moi and Hang Ang Noi). For a culture known from predominantly open-air sites in this part of Vietnam, the finding of repeated cave-use may point towards a different facet of settlement during the period of this culture, during the mid-Holocene sea transgression.

We returned to **Hang Hanh** on 7th September and worked through here until 9th September. A period during which we were joined by colleagues from the Institute of Archaeology: Dr Nguyen Truong Dong and Mr Pham Thanh Son. Disturbed surface layers (one yielding a historical coin) in our GPR-guided 1 x 2 m trench quickly gave way to a shallow but highly productive set of contexts (most particularly A507). These contained large quantities of Da But ceramic sherds (some quite large), as well as marine and riverine shell, crab and diagnostic large vertebrate faunal remains (albeit with the latter in small quantities) – including monkey and monitor lizard. The context (A507) bottomed-out in

Square A (the 1 x 1 m nearest to the rock-shelter wall) onto some mid-sized rocks. One small find (Number 2 – an elongated river cobble – was found against the rocks in the final scrapings of the morning. The trench was then covered over with a tarp and weighted down with rocks to protect it ahead of anticipated further work here, perhaps in November this year. In all likelihood the partial fragments and bone debris we have been recovering getting from within the trench represent the scraps of refuse that stayed in the living space of the rock shelter; most of the food waste and other material is probably on/in the large talus slope that lies in front of the rock shelter – investigation of this latter at some point might prove informative, provided the stratigraphy of accumulation can be established.

No further archaeological excavation was carried out during this field season, though we visited two potential locales during the morning of 10th September. The first of these, a large single cavern cave, would have been a worthy site were it not for the concrete floor covering. The second location was another rock-shelter (Temple rock-shelter). Preliminary scraping of the surface here by Dong and Son recovered riverine and marine shell fragments – suggestive of some evidence for early occupation. A 2 x 3 m area was scanned with the GPR; results of this are included in Annex 1.

Objective 4: future work packages

In Hanoi, senior team members met with Dr Tran Tan Van (SUNDASIA co-investigator) and Dr Nguyen Dai Trung at the VIGMR to discuss data sharing, software compatibility and the development of a research plan in the field of GIS. Meetings between Ryan Rabett and Nguyen Truong Dong discussed the importance of accessibility to the scientific work of the SUNDASIA project within the Vietnamese archaeological community (and beyond). To this end it is our intention to instigate a programme of translating project research papers (or summaries thereof) into Vietnamese. We also discussed greater integration between the Institute of Archaeology and the SUNDASIA project in the field of radiocarbon dating (an area relating directly to the forthcoming PhD in this field to be held at Queen's University Belfast). Ryan Rabett, Nguyen Truong Dong and Bui Van Manh (vice director of the Trang An Management Board) also laid the ground-work for a project workshop, probably to be held at the Bai Dinh Hotel in late March 2017 (and assisted with funds from the SUNDASIA project). The twin aims of this will be to encourage further integration with Vietnamese archaeologists and related scholars (e.g. in the field of biodiversity) and to extend the results of project work to other stakeholders through presentations and interviews attended by local media.

CONCLUSION

Although the preliminary schedule could not be adhered to all its exactness the Project, together with its local collaborators within the Trang An Management Board and with colleagues from the institutes of Archaeology and Geosciences in Hanoi, was able to meet each of the stated objectives for this season of work, new and relevant geophysical and archaeological discoveries were made, a new avenue of biodiversity research was instigated very productively, and plans were put in place going forward in terms of forthcoming project work packages and joint dissemination of results.