CHAPTER 8

ARCHAEOLOGICAL SURVEY IN THE TRÀNG AN ECO-RESORT, NINH BINH, NORTH VIETNAM: A BRIEF REPORT

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INTRODUCTION

During the Late Pleistocene the increase in continental landmass created by the exposure of the Sunda Shelf, coupled with changes in the atmospheric circulation (caused by high latitude glaciation) would have had a significant effect on weather and environmental conditions. The climate in this part of Southeast Asia is currently characterised by a significant dry period from Oct./Nov. until Mar./Apr., and increasing rainfall between, peaking in Jul./Aug. with an average annual rainfall receipt of between 1,000 and 1,500mm. Oxygen isotope data from planktonic foraminifera indicate that during the Late Pleistocene tropical oceans were 1-2°C cooler than they are today (Broecker, 1996). This is likely to have limited the occurrence of tropical typhoons and reduced convectional precipitation (Kellman and Tackaberry 1997). Overall, annual rainfall may have been c.30% below current values (Urushibara-Yoshino and Yoshino 1997; Verstappen 1975). Monsoon winds, though, may have been stronger (Petersen 1969).

Climatic amelioration after the Last Glacial Maximum resulted in a major redistribution and restructuring of habitats through the punctuated inundation of the Sunda Shelf (Hanebuth et al. 2000), and in further climatic shifts. Palynological evidence suggests that one of the consequences for the region was the development during the early millennia of the Holocene of a heightened monsoon system that was stronger than is experienced today. Data from Yeak Kara, in north east Cambodia shows a notable vegetation change around 8.5 kbp, likely reflecting this shift to wetter conditions, which would then prevail until c.5 kbp (Penny 1999).

Taken together, the evidence suggests that areas along the northern edge of Continental Southeast Asia, including northern Vietnam, would have experienced marked shifts in seasonal conditions across the Pleistocene-Holocene transition. It is hypothesised that such shifts are likely to have had a significant effect on the site occupation and resource-use patterns of early human groups living here. Exploring the process of human adaptation to these changes is the principal objective of the Tràng An Project.

The Tràng An Eco-Resort covers an area of 2,500 hectares centred around an isolated Triassic limestone massif on the southern edge of the Song Hong delta, Ninh Binh Province, North Vietnam. Archaeological investigation within the park is being undertaken jointly by the
Xuan Truong Construction Corporation (the park’s developers) and the McDonald Institute for Archaeological Research, University of Cambridge, under the direction of the lead author. The project commenced in May 2007, at the invitation of Mr. Nguyen Van Truong, the General Director of the Xuan Truong Corporation and of the Ninh Binh People’s Committee; the project also has the official backing of the Vietnamese Ministry of Culture, Sports and Tourism.

The main focus of excavation work to date has been concentrated in two chambers at the SSE-facing site of Hang Boi (“Fortune-Teller’s Cave”). The cave is located 35.6 km from the current coast at Lat. 20° 15’ 32”N; Long. 105° 53’ 17”E and at c. 78 m asl, overlooking a small cultivated lowland doline. A full report on work carried out at Hang Boi to date (Rabett et al., in review) is about to be submitted for publication. In summary, work in the cave mouth (designated, the ‘Upper Cave’) focused on excavating a large shell midden. Range-finding AMS 14C dates obtained by our project show that sustained (though probably episodic) occupation leading to the deposition of this midden concluded in the Early Holocene. An undisclosed time afterwards the midden was capped by a speleothem deposit. Efforts are currently under way to obtain a Uranium-Series date on this flowstone. We anticipate that it likely developed during the period of enhanced precipitation associated with the Holocene Climatic Optimum c.6-4 kya.

Charcoal obtained from deposits at the current base of the excavation (c.2 m below the ground surface) has provided a calibrated 14C date in the very last millennium of the Pleistocene: 10,362±32BP (UBA-8373) (12,383-12,075 cal. BP) (see Gibbard and van Kolfschoten, 2004; Rabett et al., in review). The basal deposits of the midden have not yet been reached, giving every indication that this occupational record will extend further into the Late Pleistocene.

Work carried out by this project in a second chamber at Hang Boi c.18m below the cave mouth (designated, the ‘Lower Cave’) has yielded further evidence of human presence at the site including several sherds of pottery identified by one of us (NCT) as belonging to the local Mid-Holocene Da But archaeological culture. The exact relationship, if any, between activities in the Upper and Lower Cave has yet to be established and there remains the possibility that the Lower Cave was originally accessed by an alternate entrance, now lost as a result of rockfall. However, these finds nonetheless point to human presence in the vicinity of the cave several millennia after the accumulation of the Upper Cave midden had ceased and raises questions about how settlement and economic patterns changed across the Pleistocene-Holocene boundary, during a period of significant coastal inundation in this part of Vietnam. In order to help consolidate our emerging understanding of how human groups were using the local landscape and its resources during this period, we undertook a short season of survey work in late 2007 to prospective sites beyond Hang Boi. The remainder of this paper presents preliminary findings from the three locales surveyed during this season.
HANG CHÔ (“MARKET CAVE”)

This north-facing rock-shelter is located 2.6 km SSE from Hang Boi at Lat. 20° 14’ 16.8”N Long. 105° 53’ 57.2”E and at an elevation of 113 m ± 8 m. To access the site currently it is necessary to wade a short distance through boggy ground from the edge of an access waterway and then make a relatively short but steep ascent through secondary growth forest to the limestone cliff overhanging the site.

It was immediately apparent that the rock-shelter is still being used periodically by local people. This was indicated by several empty plastic water bottles on the floor and a recent stone-lined hearth. Two plastic-lined hollows were situated in such a way as to catch dripwater from the rock overhang in the eastern and western portions of the shelter also attest to recurrent visits by people, as does the relatively well-worn trail leading up to the site. Cyclophorid (land snail) shells were scattered across the surface in appreciable numbers, as were fragments of animal bone, which we determined were also most likely of recent origin.

The rear wall of the rock-shelter lies 7.60 m back from the drip-line, providing suitable protection against the elements. Measurement of the long axis or height of the shelter was inhibited by heavy undergrowth, which obscured the shelter floor to the east of the current occupation area. Thus it was not possible to make an accurate estimate of the total surface area beneath the shelter; however, it is clearly significantly greater in extent than the area exposed presently.

We proceeded to excavate one 0.5 m x 0.5 m test pit (Figure 8.1) located 2.60 m from the back wall and c.0.5 m east of the modern hearth. The brown surface sediment was fine and silt in texture though compacted – probably due to localised trampling by people moving around in this part of the site. As we continued to excavate there was a change in sediment colour and material to an ashy grey-brown, almost certainly a hearth deposit or part of an ash dump. Further digging revealed a layer of highly fragmented shell, which also included evidence of burnt and reddened, but still compact, sediment (Figure 8.2). The frequency of whole shells began to increase with depth and sediment colour returned to being brown. Rudimentary examination indicated that the majority of these were cyclophorids, but some fresh water shells were also present. Two charcoal samples were taken from the northern side of the test pit at this level (c.10 – 12 cm below the modern ground surface), where-upon excavation was halted due to time constraints. A single sherd of glazed pottery was removed from the south section. The test pit was back-filled.

HANG DÁ MÁNG

This small, east-facing rock-shelter had no known local name and so was given the name of a near-by doline. The shelter lies on a steep rock-strewn and thickly forested slope 63 m asl (Lat. 20° 15’ 06.5” Long. 105° 53’ 21.0”; UTM 48Q 592 867 223 9595). The site lies at the NE edge of a much larger collapsed shelter. The space of this is latter is completely filled by large limestone blocks that have fallen from the overhanging cliff. Hang Dá Máng itself comprises one clear area (c.9.5m²) of floor (Figure 8.3) containing sediment either protected by or accumulated behind a low natural limestone façade, and one further chamber (c.20m²)
within its NW corner. This chamber is filled to within 1 m of the roof with sediment matching those at the front of the shelter (Figure 8.4).

A 0.5 x 0.5 m test pit was opened immediately off a base-line aligned on the North axis of the shelter. The excavated sediment consisted of small dry clasts of red-brown clay with occasional small lumps of limestone (c.10 cm³) and was found to be very compacted requiring the use of a section hammer to break up before it could be removed by trowel. We observed a light scattering of shells on the surface, but in nothing like the quantities seen at either Hang Chô or Hang Boi. Only the first 10 cm of deposit was removed, but in contrast to the aforementioned sites, this was found to be completely devoid of any material other than periodic root tendrils. No shell was uncovered below the surface. During our brief reconnaissance of the area behind the stone façade we could find no evidence of occupation.

**HANG TRÔNG (“EMPTY CAVE”)**

Hang Trông was the most remote of the three sites surveyed. This cave is situated high up in a karstic tower (Figure 8.5), and at 141 m asl, is almost exactly twice as high as Hang Boi. Hang Trông has two entrances opposite one-another on either side of the tower and is located at Lat. 20° 15' 01.6”N, Long. 105° 53' 24.4”E. Potential variation in the clemency of the environment in this cave during different seasons, as a result of the direct passage of airflow through these entrances, may well have had implications for its prehistoric occupation. The character of the surface deposits, recalled closest those of Hang Boi and hence the possibility of a comparable intact occupational history.

It is quickly established that the current floor area comprised discrete areas of crushed shell – with cyclophoroids featuring quite strongly – in addition to areas of midden that appeared to contain significant quantities of whole shell. This kind of spatial patterning in shell deposits has not been identified, thus far, at Hang Boi and suggests that different areas of the floor have experienced different intensities of foot-traffic. Unlike the sediment excavated at Hang Đá Măng, and very much like that found at Hang Chô, and Hang Boi, the surface sediment at Hang Trông was found to be very fine and silt-like in texture.

A 30m nylon tape was used to establish the mid-point of the South entrance, the total span of which was 9 m. From here a bearing was taken through the apex of the North entrance. The long (y) axis of the cave is aligned almost exactly North-South (342° NNW 162° SSE; see Figures 8.6 and 8.7). The y-axis of the cave (entrance to entrance) was 21 m, its x-axis (across the cave) was 9.35 m. The total exposed floor area was thus calculated to be c.196 m². The cave floor itself is slightly inclined and largely clear of rock, though there are some larger slabs of stone on the floor across the North entrance, potentially the result of stoping (roof collapse) in this area (visible in Figure 8.6). There are indications at the South entrance for a stone-lined hearth area and the possible vestiges of a linear stone structure extending half-way across this entrance.

A single 1 m x 1 m test pit was dug on the western side of the base line, where-in we proceeded to excavate three stratigraphically discrete layers over a total depth of ~6 cm in the brief time available.
Surface debris, included fragments of wood, broken and whole shell, and some small limestone fragments (c.10 cm³). Once this superficial material was cleared off (no more than 1 cm deep), the sediment was dark brown in colour, very fine in texture and labelled as Layer 1. A small soil sample was taken of this layer from the eastern edge of the test pit. Interestingly, with the loose surface debris cleaned off, this layer was almost entirely free of shell fragments.

Layer 1 was approximately 1-2 cm deep and overlay a more mottled, ashy grey deposit (Layer 2). By this point we were digging only in the eastern half of the 1 x 1 m test pit (i.e. the SE and NE quadrants) and a second (i.e. Layer 2) soil sample was bagged. During this period one of us (NCT) uncovered and photographed a palm-sized limestone pebble that appeared to have been knapped – human manufacture has since been confirmed on this piece (T.Reynolds, pers. comm.).

As we excavated the frequency of shells increased significantly; first broken and then whole shells began to appear across the two excavated quadrants and their occurrence persisted with depth. No animal bone was observed or recovered from within the excavation. This layer of increased shell density we designated Layer 3 and sampled and excavation halted. A single small piece of charcoal (0.03 g) was also recovered from this layer and has been submitted to the ¹⁴C RONO Centre at the University of Belfast for AMS radiocarbon dating.

Although no animal bones were uncovered during excavation of the test pit, a large assemblage of bones from small vertebrate taxa was recovered at another location on the cave floor. This surface and probably recent assemblage was concentrated at, and radiating from a point c.1120 m north and 5 m west of the y-axis baseline adjacent to an area of flowstone close to the North entrance on the western wall. The assemblage was hand collected over an area of c.1 m² (figure 8.8). The elements were well preserved, with no evidence of trampling. Due to the taxonomic composition and relative completeness of the skeletal elements and specifically, no immediate indication of digestive processes on any bones (e.g. Andrews 1990), it was deduced that this assemblage most likely derived from the pellets of an owl (Strigidae) roosting in a bell-hole immediately above this spot. A range of taxa were represented, including large rodents (Muridae?), Himalayan Water shrew (Chimarrogale himalayica), frogs/toads (Ranidae), and freshwater fish (Cyprinidae?) (J.Harland, pers. comm.). Broken post-cranial elements from a microchiropteran bat were also in evidence in the vicinity, but these may have been derived from “deadfall” from a cave roost, as opposed to predator-mediated (e.g. Stahl 1996) e.g. owl, deposition. The relative size of the represented taxa and a bias towards prey types that are characteristic of riverine habitats is suggestive of a relatively large owl possibly a fish-owl (Bubo sp). There appeared to be no evidence of fur, or other soft matter which is frequently incorporated into owl pellets; a feature that could be as a result of wind through the cave dislodging such light material. As well as representing an excellent opportunity to examine a predator-mediated sample of the local small vertebrate faunas from which valuable ecological information may be extrapolated, this discovery also provides a cautionary note for interpretation of fish remains, should any be recovered in subsequent excavations of the site.

A final feature of considerable interest at Hang Trong was the existence low on the western wall of vestiges of calcereated shell above the level of the modern-day floor. This mirrors similar deposits that have been identified in greater quantity at Hang Boi, where they currently raise the prospect of human midden creation well into the Pleistocene.
DISCUSSION

Our brief investigation of Hang Chố suggests that there may be significant archaeological deposits at this site that warrant further study. The site’s location outside the current boundaries of the Tràng An Eco-Resort and evidence of its continued use are considerations that will have to be addressed in such an eventuality. Access from the waterway at the foot of the slope is currently problematic, but would not prove too great a logistical challenge. Preliminary work at the site should involve clearing back the dense undergrowth and further sampling by test pit to establish the extent of the occupational area.

The deposits at Hang Đà Màng, at least to the depth investigated, appear to be devoid of archaeological material. The character and content of the sediment are distinctly different to those found at any of the other three sites investigated by the Tràng An Project with identifiable human activity. Investigation of the sediment-filled second chamber and further exploration of the larger collapsed rock shelter of which this site forms a part would be worth while, but is not seen as a project priority at this stage.

Although the time spent at the final cave, Hang Trông, was of necessity very brief, this site has clearly a great deal in its favour archaeologically. Our reconnaissance leads us to suspect that there are considerable and intact midden deposits to be found here, with possible spatial and stratigraphic organisation. The site’s aspect and altitude also make it an excellent point of comparison for the project’s principal excavation at Hang Boi, c.1 km as the crow flies to the NNW. The two caves complement each other very well. We anticipate that excavation at both will enhance significantly our understanding of early human subsistence and settlement across the Pleistocene-Holocene transition in this part of northern Vietnam.

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Figure 8.1: Beginning excavation of the test pit at Hang Chơ rock-shelter

Figure 8.2: Reddened sediment and shell layer within the Hang Chơ test pit
Figure 8.3: Excavation of the test pit at Hang Đá Máng

Figure 8.4: Inside of the secondary sediment-filled chamber at Hang Đá Máng
Figure 8.5: View out over the landscape from the north mouth, Hang Trọng

Figure 8.6: The South entrance of Hang Trọng, as viewed from the north mouth
Figure 8.7: The north entrance of Hang Trồng, as viewed from the south mouth. In the foreground, measuring tapes are being laid ahead of excavation.

Figure 8.8: Hand collection of small vertebrate remains near the north entrance, Hang Trồng.