



Human palaeontology and prehistory (Prehistoric archaeology)

Direct dating of a Neolithic burial in the Laang Spean cave (Battambang Province, Cambodia): First regional chrono-cultural implications

*Datation directe d'une sépulture néolithique en grotte (Laang Spean, Province de Battambang, Cambodge) : premières implications chrono-culturelles régionales*Valéry Zeitoun^{a,*}, Hubert Forestier^b, Heng Sophady^c, Simon Puaud^d, Laurence Billault^b^a UMR 9993 CNRS, Musée Guimet, 19, avenue d'Iéna, 75116 Paris, France^b UMR208 IRD-MNHN, 57, rue Cuvier, 75005 Paris, France^c Ministère de la Culture et des Beaux-Arts de Phnom Penh, 227, Kbal Thnal, Preah Norodom Boulevard, Sangkat Tonle Bassac, Khan Chamkar Mon, 12305 Phnom Penh, Cambodia^d UMR 7194 du CNRS-MNHN, 1, rue René-Panhard, 75013 Paris, France

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ABSTRACT

If, because of recent geo-political events which took place in Cambodia, the remarkable discovery made at the end of the 19th century on the banks of Lake Tonle Sap of the Neolithic site of Samrong Sen has fallen from current public knowledge, Neolithic sites situated in caves remain the least-well documented of sites throughout the whole of South-East Asia. The discovery of a Neolithic burial in a cave dating from 3310 BP is the significant result of recent prehistoric excavations commenced in 2009. This discovery provides us with an original chronological, cultural landmark for South-East Asia, at the beginning of the Ages of Metal. An in-depth description of this grave allows us to envisage preliminary regional comparisons, thereby permitting a broader taking into consideration of the evolution of funerary practices in this part of the world.

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R É S U M É

Si du fait des événements géopolitiques récents au Cambodge la découverte marquante faite à la fin du XIX^e siècle sur les berges du lac Tonle Sap du site néolithique de Samrong Sen est tombé dans l'oubli, les sites néolithiques en grotte demeurent les moins documentés pour l'ensemble de l'Asie du Sud-est. Résultat significatif d'une nouvelle recherche préhistorique entreprise depuis 2009 dans la grotte de Laang Spean, la découverte d'une inhumation néolithique datée de 3310 BP offre un jalon chronoculturel original pour l'Asie du Sud-Est qui, à cette date, s'ouvre à la métallurgie. Une description détaillée de cette sépulture permet d'envisager une première comparaison régionale et ouvre ainsi à une réflexion plus large sur l'évolution des pratiques funéraires dans cette région du monde.

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1. Introduction

If pottery elements, considered as being characteristic of the Neolithic Period, appear to be more and more ancient in China (Boaretto et al., 2009; Liu, 2009; Lu, 2011), these

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remains, together with polished stone – axes, adzes, sickles and chisels – remain less characteristic or totally uncharacteristic of South-East continental Asia. These diffuse objects are found in isolation within a regional Hoabinhian context, which is very different to that which exists elsewhere in the world at that epoch (Cauwe et al., 2007; Demoule, 2009; Guilaine, 2011). Furthermore, these rare Neolithic objects were quickly replaced by those emanating from the Metal Ages. Thus, the Neolithic and Metal Ages jumble together – as can be seen in the chronological-cultural sequence found on the Ban Chiang site in Thailand (White, 2008) with an “Early Bronze Age” contemporary with regional sites which were “still” Neolithic, and also the series of datings on the Khok Phanom Di site (Higham and Bananurang, 1990) or even the Ban Non Wat site (Higham, 2008). In addition, the North-East and the maritime strip of Central Thailand, which are the regions situated the closest to the Battambang province where the cave of Laang Spean is situated, witnessed the development of burial grounds with metal objects found as part of grave offerings. These two regions of Thailand, where sites are numerous and the best archaeologically-documented for the region (Higham, 2002), seem to indicate the development of burial grounds and a clear separation between collective burial grounds and habitations (Higham, 2004). For Cambodia, only a small amount of recent prehistorically chronological-cultural data exists. So it is for the upper levels of Laang Spean, excavated in the 1960s, which were dated as being 4000 ± 90 BP (non calibrated) (Mourer, 1977) and for which is attributed a clay pot with an annular pedestal (Mourer and Mourer, 1971) found on numerous Neolithic sites in Thailand. However, as far as burials in caves are concerned, data is very scarce, as it is for the whole of South-East Asia, and it is possible that the troglodyte milieu distinguishes itself from open-air sites, thereby begging the question regarding the function of a site – as, for example, the Cambodian Neolithic site of Samrong Sen.

2. Laang Spean cave burial site

Discovered in 1965 by Cécile and Roland Mourer during a systematic survey of the limestone massifs in the Battambang region, the Laang Spean cave is situated on the edge of Sdao village mid-way between Battambang town and Pailin, close to the frontier with Thailand (Fig. 1). Nesting at an altitude of some 100 m at the summit of Phnom Teak Trang, which contains fifty caves and rock shelters inhabited in prehistoric times, Laang Spean has a ground surface of approximately 1000 m², measures 30 m high and consists of three main chambers of which the roof of the largest has fallen-in. Excavations were halted for a time in 1970 owing to local problems but in 2009, meticulous excavations of 8 m² took place in the second chamber which is situated in a central position (Fig. 2). The dig was used for training purposes within the context of the Franco-Cambodian Prehistoric Mission (Forestier et al., 2012). The ensemble of the stratigraphical sequence of Laang Spean led to a first series of radiocarbon dating, indicating a minimum date of 8500 BP (non calibrated) for the Lower Hoabinhian level and a more recent date of

1200 ± 70 BP (non calibrated) (Mourer, 1994; Mourer et al., 1970). Isolated human remains had been found during the initial excavations (Mourer, 1994) and our further research revealed new fragments of human bones, which once collected and analysed in terms of nature, ages and different apparel, showed that at least five different individuals had been interred in the second Laang Spean chamber. The grave of an adult individual was found on the last day of our excavations which was intrusive to the Hohabian levels (Fig. 2). In-line with field-anthropology reading (Duday, 2009; Duday and Guillon, 2006; Duday et al., 1990) for which the aim is to determine the original positioning of the defunct at the time of burial (Fig. 3).

3. Materials and methods

The human bone remains found during the dig do not include a complete skeleton, but several skeletal parts still in anatomical connection and this, associated with offerings, led us to state that this was well and truly a grave. Differential preservation of the different bone specimens was notable. In fact, if the bones found during the dig are generally in a very fragile condition, whole long bones and fragments of such (humerus and lower limbs) found were relatively well-preserved. On the other hand, no sign of cutting or the results of gnawing were observed. The calvaria was not found and only the left part of the jawbone was discovered. The latter was completely without teeth, canines and molars having dropped out ante mortem; a remodelling of the alveolar bone of these mandibular teeth attesting to the theory. The spinal column was represented only by a fragment of the body from the sixth thoracic vertebra found in the neck area, and by similar fragments from the ninth, tenth and eleventh lumbar situated close to the sacrum which itself was broken and eroded in its posterior area. The distal part of the right pelvis and the left coxal bone were practically complete but the rib-cage was only represented by a dozen fragments of ribs – all unconnected but found within the thoracic cavity. Concerning the upper limbs, the right humerus was still connected to the scapula but the right radius and ulna had disappeared as had the left scapula. The left humerus was incomplete in its proximal portion and was situated in the place of the right forearm with the distal parts of the incomplete left radius and ulna in a disorderly state at the right elbow place within the thoracic volume. As far as the right hand is concerned, the scaphoid, the capitulum and the lunatum were found in the basin. Concerning the left hand, the metacarpal bone I and its proximal phalanges, middle and distal of metacarpal bone II, the proximal phalanges, and middle and distal of metacarpal bones III, IV and MV were still connected next to the proximal part of the left femur. For the right hand, the metacarpal bone I and its proximal and distal phalanges, as well as the distal and middle phalanges of the metacarpal bone II were anatomically connected whereas the proximal phalanges of metacarpal bones III and IV were in close contact. The whole of the hand must have been closed with fingers and thumbs tight together, the ensemble placed next to the proximal part of the right femur in symmetrical fashion to the left hand. The lower limbs are better



Fig. 1. Regional map showing the position of Laang Spean cave and the sites mentioned in the text. View of Phnom Teak Trang including Laang Spean cave.
Fig. 1. Carte régionale de la grotte de Laang Sean et des sites mentionnés dans le texte. Vue du massif de Phnom Teak Trang où se situe la grotte de Laang Spean.

represented with only the left patella and all of the phalanges of the right foot missing.

4. Burial description and interpretation

The grave was dug on a north-south axis with the head of the deceased placed towards the south. The edges of the grave were only clearly visible for some 45 cm at the bottom of the latter. Taking into consideration these anatomical observations, it is possible to establish the initial positioning of the body before the anatomical elements were disrupted. Thus, it would seem that this individual had been laid in supine position with the arms straight and the hands touching the upper part of the lower limbs. The legs were straight with the feet being placed tightly together. During decomposition, rotation of the lower limbs towards the outside of the cadaver had made the soles of the feet face outwards which suggested that the feet had initially been in a vertical position – perhaps pushed-up against the sides of the grave thereby maintaining the knees in an elevated position in relation to the hips and the feet. It is possible to put forward the hypothesis that the clothing had maintained the lower limbs in anatomical connection. In the absence of any indication of the presence of any burrowing animal, it would seem that the grave had been disturbed at some time. In fact, the discovery of an overturned pot, of several broken pots over a large limestone block situated on the thorax of the buried individual and the scattering of bone and pottery pieces on the block suggests that the grave had been opened and re-sealed at a

time following decomposition of the body. As the position of several anatomical parts and joints (distal parts of hands, patellas, tibias, tarsals, metatarsals and phalanges, etc.) had either remained in their original positions or been moved together after decomposition of the flesh, it was possible to reconstruct where and how grave disturbers had displaced the different anatomical remains and pottery pieces. In the same way, anatomical articulations could be replaced and pottery remains reconstructed which led to our being able to work out the original conditions of the burial in terms of positioning of the corpse and of the grave goods.

As the bone remains were fragile, only the biological data collected on-site enabled us to establish that this was the grave of an adult male with 99.76% probability according to the DSP Method (Murail et al., 2005). His height had been 170 ± 2.3 cm according to Chusiri's Regional Anthropological Tables (1991) on the basis of the maximal length of his femurs.

Several objects associated with the burial can be interpreted as being funereal offerings: a large earthenware globular jar had been placed on the lower part of the legs, just below the knees, an ochre pencil and a tortoise shell had been laid-out between the legs underneath the jar. Five other pottery items had also been placed around the body, around the head and down to the upper left member. These pottery objects were of two principal ceramic types: jars and cup-like bowls with ring-shaped bases (Fig. 4). Additionally, a lower, left pierced canine belonging to a Suid was found at plexus level and would suggest the presence of an item of necklace and a preform of a green-coloured adze

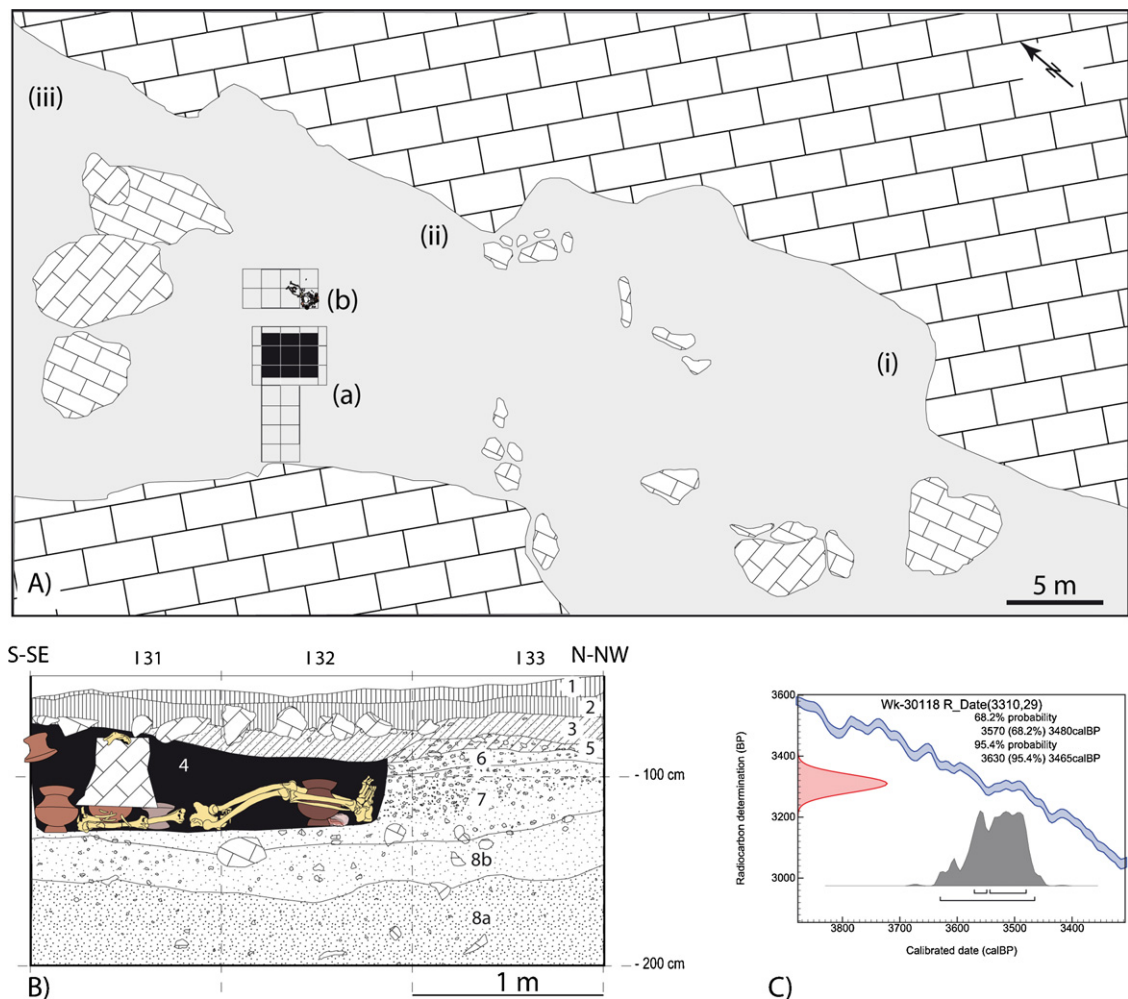


Fig. 2. Position and section of the grave in the cave at Laang Spean. A. Map of the cave at Laang Spean: (i): chamber 1; (ii): chamber 2; (ii): chamber 3; (a): test-pit carried out by R. and C. Mourer; (b): position of the grave. B. Synthetic stratigraphic section: 1: gray silty loose superficial level; 2: reddish gray sandy silt sediment with carbonate and limestone platelets; 3: gray sandy silt layer with land snail tests; 4: grayish brown matricial sediment filling the pit; 5: gray sandy silt with land snail tests; 6: reddish brown silty sand sediment, with granules and small limestone scales. The sediment is rich in burnt bone and *Unio* remains. It corresponds to the first Mourer's Hoabinhian level (1994); 7: pinkish layer sediment with calcareous coarse fraction and bioclasts less abundant; 8a: sandy silt sediment-rich in land snail remains; 8b: same sediment like 8a but less pinkish, with more bioclasts and limestone blocks. C. ^{14}C Diagramm of calibration of the interred individual.

Fig. 2. Position et coupe synthétique de la sépulture dans la grotte de Laang Spean. A. Carte de la grotte de Laang Spean: (i): salle 1; (ii) salle 2; (ii) salle 3; (a): sondage réalisé par R. et C. Mourer; (b): emplacement de la sépulture. B. Coupe stratigraphique synthétique: 1: niveau superficiel limoneux gris très meuble; 2: sédiment limono-sableux gris rouge carbonaté, riche en plaquettes calcaires; 3: couche limono-sableuse grise, avec tests de gastéropodes terrestres; 4: sédiment matriciel brun gris remplissant la fosse; 5: couche limono-sableuse grise, avec tests de gastéropodes terrestres; 6: sédiment brun rouge foncé sablo-limoneux riche en granules et en petites écailles de calcaire, riche en fragments d'os brûlé et de valves de lamellibranches dulçaquicoles (*Unio*) correspondant au niveau Hoabinhien décrit par R. Mourer (1994); 7: couche rosée, avec fraction grossière calcaire et bioclastes qui deviennent moins abondants; 8a: sédiment limono-sableux, riche en restes de gastéropodes terrestres; 8b: sédiment identique à 8a mais de couleur moins rosée, avec des coquilles plus abondantes et présence de blocs calcaires. C. Diagramme de calibration de la datation directe ^{14}C de l'individu inhumé.

in fine greywacke was also found in the grave whereas the cranium of a large bovid, broken in situ, was found on the limestone blocks within the pit (Fig. 5).

5. Chronological elements

Knowledge concerning the chronological development of pottery in Cambodia is still patchy when compared to that of more recent developments relating to Classical and Pre-Angkorian periods (Micksic, 2003). Ancient pottery items discovered at Laang Spean in the 1960's and

1970's were divided into two distinct groups by Mourer (1986) with, in one group, corded marked or paddle marked pottery from the Late Hohabinhian dating from 6240 ± 70 BP (non calibrated), followed by a second group of incised and impressed ware Neolithic pottery dating from between 3970 ± 90 BP and 4000 ± 90 BP (non calibrated). Cup-shaped examples with a ring-shaped base which we found in the grave are identical to those found earlier (Mourer and Mourer, 1971). One radiocarbon dating carried out on the bone collagen of the deceased gave a calibrated date of 3310 ± 29 BP (Wk 30118) (Fig. 2) with a

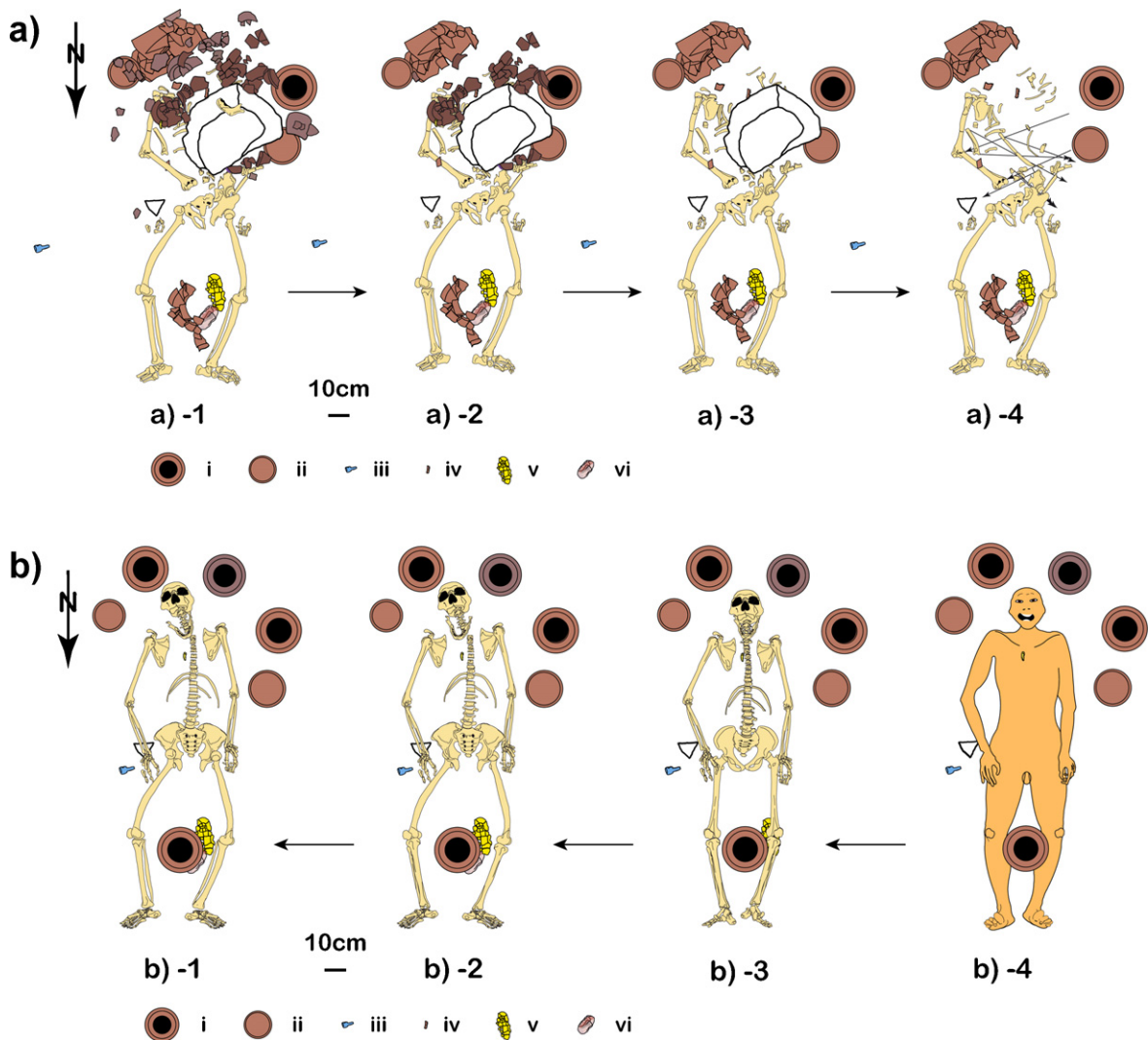


Fig. 3. (a) Position of the body in the tomb as found during excavation. The arrow shows the different step of the excavation: a)-1: cranial fragment and left hemi-mandible lying on a calcareous block; a)-2: broken pottery sherds lying on the calcareous block; a)-3: positioning of the calcareous block on the disturbed skeleton; a)-4: positioning of the body before the disturbance of the burial. Remodelling of anatomical parts of the thorax and upper limbs after decomposition and decay of flesh: the left humerus and bone of the forearm have been moved to the right side of the body with both left and right metacarpal bones and phalanges remaining in initial connexion near the basin; (b): restoration of the initial position of the deceased in-line with field-anthropological analysis. The arrow shows the decay and the remodelling of the body before the disturbance of the grave; b)-1: lower limbs and feet appearing by their medial side; b)-2: rotations of the lower limbs towards the outside of the cadaver are exaggerated due to the separating coxal bones and their collapse. The right patella still in connexion nevertheless the whole moving of the lower limb suggests that femur, tibia, fibula and foot preserve their initial connexion. Thus, the feet should initially appear by their distal side in a vertical position; b)-3: the globular jar placed on the lower part of the legs, just below the knees, perhaps pushed-up against the sides of the grave the whole of the lower limbs which happened in a void but, the full connexion of the both lower limbs suggests the presence of some clothing; b)-4: hypothetical initial position of the deceased with five poteries all around the cephalic and thoracic part of the body; i: globular jar; ii: cup-like bowls with ring-shaped base; iii: stone adze; iv: left pierced canine of a Suid; v: tortoise shell; vi: ochre pencil.

Fig. 3. (a) Position du corps dans la tombe lors de la fouille, avec illustration des différentes étapes de la fouille (sens de la flèche); a)-1: fragments crâniens et hémimandibule gauche reposant sur un bloc calcaire; a)-2: poterie brisée sur le bloc calcaire; a)-3: dépôt du bloc calcaire sur le squelette perturbé; a)-4: remaniement des éléments anatomiques de la portion thoracique et appendiculaire après décomposition du corps: l'humérus gauche et les os du carpe gauche se retrouvent désordonnés du côté droit de l'individu alors que les phalanges des deux mains restent en connexion anatomique; (b): hypothèse de restitution de la position initiale du corps lors de son inhumation avant perturbation de la sépulture. La flèche indique la décomposition et les mouvements des ossements au cours du temps; b)-1: les membres inférieurs et les pieds apparaissent par leur face médiale; b)-2: la rotation des membres inférieurs vers l'extérieur du volume du corps est accentuée par la séparation des os coxaux et leur affaissement. Le maintien de la patella droite en connexion ayant suivi ce mouvement suggère que les membres inférieurs et les pieds ont opéré une rotation d'ensemble conservant l'agencement initial. Ainsi, les pieds devaient initialement pointer vers le haut, la voûte plantaire en regard de la paroi de la tombe; b)-3: la poterie déposée sur les jambes sous le niveau des genoux a pu contribuer au mouvement d'ensemble des membres inférieurs qui s'est réalisé dans un espace vide, les membres inférieurs pouvant être contenus dans des habits; b)-4: position initiale présumée du corps lors de l'inhumation, avec ensemble de vaisselle funéraire autour de la portion céphalique et thoracique de l'individu; i: vase; ii: coupe à pied annulaire; iii: herminette; iv: canine de suidé percée; v: carapace de tortue terrestre; vi: crayon d'ocre.

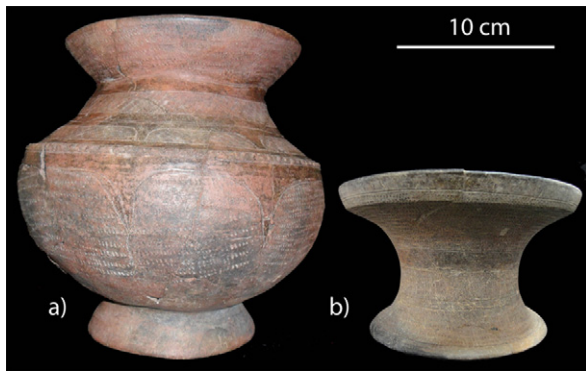


Fig. 4. Different types of pottery objects found in the grave: (a) globular jars and (b) cup-like bowl with ring-shaped base.

Fig. 4. Différents types de poterie trouvés dans la tombe : (a) vase à panse et (b) coupes annulaires.

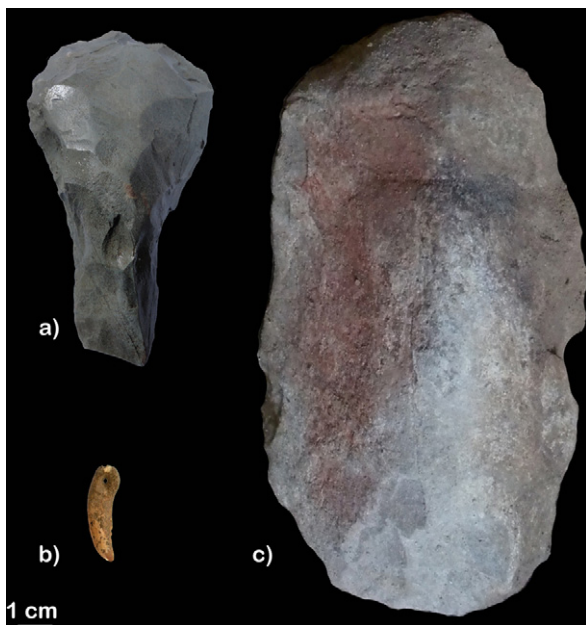


Fig. 5. Stone adze, left pierced canine of a Suid and ochre pencil from the grave.

Fig. 5. Herminette, canine gauche percée d'un Suidé et crayon d'ocre retrouvés dans la tombe.

$\delta^{13}\text{C}$ of -13.9 , which suggests the possibility of a diet which included food from marine origin towards the end of his life (analytical report F. Petchey). Even if a rigorous comparison of uncalibrated ancient datings with modern calibrated datings has been put forward (Higham and Higham, 2009) for South-East Asiatic sites, the gap which exists between these two types of dating does allow the suggesting of a preliminary regional comparison chart for the most recent Neolithic period.

6. Discussion

As far as graves contemporary with that at Laang Spean in Cambodia are concerned, several have been brought to light on the banks of Lake Tonle Sap, at Samrong Sen which

is one of the earliest prehistoric sites in the world to have been described (Cartailhac, 1877). Levels of accumulated shells have been dated as being at least 3230 ± 120 years BP (non calibrated) (Carbonnel and Delibrias, 1968). Dating of 3995 ± 160 BP recently obtained (Vana, 2002) would indicate the end of the Neolithic period thereby confirming the previous estimate. Other dating carried-out in the Phnom Loang C62b cave at Kampot, in southern Cambodia (Carbonnel and Delibrias, 1968) mentioned traces of Neolithic occupation of around 4370 ± 135 BP (non calibrated), but this occupation has been challenged (Mourer, 1994). In the North-West of Cambodia, in that part of Baray to the west of Angkor, reconstruction work on the buildings and temples by École Française d'Extrême-Orient presented the possibility of carrying out an otherwise unplanned archaeological excavation in 2004 during an exceptionally dry period which facilitated greater access to a zone normally covered by the waters of a reservoir. Thus, the work carried out at Koh Ta Méas (Pottier, 2006) indicated the presence of several burials including that of an adult buried in supine position with the upper limbs stretched out alongside the body on a NE-SW axis. According to the documentation (Pottier, 2004: p. 49), it would seem that the feet joints had become set during decomposition. During this process of decomposition, the femurs rotated in an exaggerated fashion towards the outside of the body mass which would suggest a collapsing of the hips which had been placed on a cushion of degradable matter. A lateral constraint seems also to have restricted the scapular belt, which suggests that a shroud or other garment had been in place. Four pottery items had been placed in a line on either side of the corpse. A cup-shaped object with a ringed base was found towards the top of the crown and a Suid's skull had been placed at the feet. In addition to the pottery offerings and of the initial position of the deceased, as at Laang Spean, turtle bones were also found in the grave. The first Radiocarbon dating carried out on a piece of charcoal taken from infill of the grave gave an age of 2870 ± 60 BP (Pottier, 2006) suggests a more recent date than that for Laang Spean but a new series of radiocarbon dating on elements found in the grave results in an age of between 2870 and 3400 BP (Pottier, oral report) which is closer to the direct dating carried out at Laang Spean.

The Neolithic Age, curiously enough, remains less-known in both continental and insular South-East Asia than the Metal Ages and even more ancient populations going back to Palaeolithic times. In addition, the chronological range of Neolithic occupations in South-East Asia has recently varied from the fifth millennium to the end of the third millennium BC with the beginning of the Bronze Age occurring between the end of the third millennium and the end of the second BC (Higham and Higham, 2009). Notwithstanding the very recent discovery of a Neolithic occupation in Burma (Pautreau and Maitay, 2010), in the Samon valley, Thailand offers the most significant data on agrarian populations at the end of the Neolithic Age (c.a. 3500 BP). More often than not, such data comes from open-air burial sites such as Khok Phanom Di, Ban Chiang, Non Kao Noi, Ban Phak Top or Ban Kao (Higham, 2004; Sorensen, 1967) which are marked by several phases of occupation described according to the stylistic evolution of pottery

objects decorated by a comb with an incised and dotted motif. However, if the main characteristic style of incised and dotted pottery was its sudden appearance towards the second half of the third millennium BP on Neolithic sites situated in the plains of the main rivers of continental South-East Asia (Rispoli, 2007), the typological characteristics of pottery in this region remain largely incomplete and its chronology imprecise – even as far as the Metal Ages. According a date to these objects is done indirectly by dating organic material remains (shells and charcoal) extracted from the infill of graves.

In continental South-East Asia as a whole, however, is it possible to find elements of comparison between graves and to detect any evolution in funereal practices?

Material associated with the grave at Laang Spean cave consists of objects utilised for funereal purposes, which is frequently the case on sites in North-East Thailand at this date but for periods, however, identified as being from the Bronze Age (Higham, 1996). This, in fact, is the case for the presence of a plastron or of elements of a land turtle and the ochre pencil. The latter object, not extensively described in archaeological literature, however reveals a funereal practice which was quite common in the region as at Khok Phanom Di where the use of ochre was widespread throughout the site (Higham and Bannanurag, 1990) from ancient Neolithic times to the Bronze Age. Pottery offerings placed at the feet of the deceased, on the lower members or around the head was a practice which existed from North-East Thailand as far as Burma and seems to have continued until the Iron Age – however, for these more recent periods, evidence of the presence of a coffin would seem to be the most important aspect of funereal practice, even if the use of the latter can go back to the Bronze Age.

As in the Laang Spean cave, the graves on the Khok Phanom Di site in the lower reaches of the Bang Pakong River on the boundary of the Gulf of Siam, most of the burials were of individuals in supine position with their upper members straight alongside the body and the lower members extended straight (Bannanurag, 1991) but orientated east-west with the head towards the east. Evidence of the use of shrouds of a vegetable matter and even of a few coffins was found. Several graves contained pottery objects placed close to the lower members. In more rare cases turtle plastron was found but in practically all of the graves red ochre was found (Higham and Bannanurag, 1990). At Khok Phanom Di, six cultural phases have been described associated with dating which are principally spread between 3730 ± 100 and 3280 ± 140 BP (non calibrated) (Higham and Bannanurag, 1990) which is close to the age determined for de Laang Spean.

When one observes sites which are geographically close to Laang spean, information relating to the occupation of the spatial area arises – as is the case for several sites in the Mun or Chi valleys on the Khorat plateau described as being vast cemeteries situated away from habitations. In this way, the moated prehistoric site of Ban Non Wat situated on the western edge of the Khorat plateau in the upper reaches of the River Mun presents a first Neolithic phase (Higham, 2004) dated around 3600 and 3200 BP (non calibrated) characterised by extended supine inhumations associated with offerings. The use of caves as funereal sites situated

away from habitations is therefore a fact which deserves closer investigation in the future but the development of the richness of the graves which lessen over time is also to be considered as is suggested by site at de Ban Non Wat with a second Neolithic phase dated between about 3200 and 2900 BP (non calibrated) which is marked by burials orientated east-west with less offerings than those found in the earlier phase but also mostly including globular cord-marked vessels and sometimes freshwater bivalve shells. This, however, creates a common Regional basis as far as funereal practices are concerned as similar graves were discovered further to the west, in Central Thailand, in the Khao Prachan valley and in the environs to the North of Lopburi. Thus, in the Ban Tha Kae habitation site, twenty-one inhumations were discovered, all orientated north-south, all with a vessel placed beyond the head and the feet and, in one case, under the knees with datings from 4450 to 3450 BP (non calibrated) (Higham, 2004) – which is very similar to Laang Spean. At the Khok Charoen site partly dated by thermo-luminescence to about 3350 to 2750 BP, funereal pottery items comprising vases with ring-shaped bases (pedestals) or another globular-shaped kind of vase with ornamentation edged by incised lines filled-in with printed or stamped surfaces also comparable to Laang Spean. Further to the west, in southern Thailand, at Laang Rongrien, explored by Anderson and dated 3720 BP (non calibrated), pedestal pots were found in a grave under a rock-shelter, associated with polished stone adze.

Other similarities exist throughout the region as a whole as far as northern Thailand where, close to the red ochre painted rock-shelter at Phratu Pha in Lampang province, for a time period of 3195 ± 55 BP to 2975 ± 65 BP (Srongisiri and Sangchan, 1997; Winalayai, 1999), pottery was also found near the head and the feet of adult individuals buried in supine position with limbs extended (Kongsuwan, 2001). A regional evolution is also perceptible, as at Pratu Pha, one of the bodies had been rolled-up in garments made from bark and another was buried in a wooden coffin – as is the case in north-eastern Thailand. Furthermore, in the Non Nok Tha cemetery, the deceased were placed in extended supine position with offerings such as pottery items, stone adze heads, grinding stones, cattle, pig and bivalve shells (Higham, 1996) but while the oldest graves were dated between 3950 and 3450 BP (non calibrated), the most recent between 3450 and 2950 BP (non calibrated) contained bronze objects marking an important change with the arrival of metallurgy in north-eastern Thailand.

7. Perspectives

In the zone of expansion of southern China, the Late Neolithic Period (4450–3450 BP) has been documented by reference to different types of sites – caves, open-air or shellmiddens giving proof that the onset of a sedentary lifestyle, of agriculture and of the abandoning of stone-knapping were relatively well established. Innovations also appeared in the creation of new shapes in pottery items and of new technological developments and of decoration such as the use of vegetable-based temper and a wide range of decoration of incised motifs and geometrical painting as well as the possible use of a

potter's wheel according to Rispoli (2007) who suggests that the practice of having recourse to burials with the defunct in extended supine position as opposed to flexed position was another innovation which originated in China and which extended towards the south. However, some graves with individuals in an extended position existed in the ancient Holocene period at Ban Rai in northern Thailand (Shoocongdej, 2006), and at Moh Khiew (Pookajorn, 1990, 1994, 2001) in the south. This supposes, therefore, that another cultural basis existed before this more recent Chinese influence. Is Cambodia one of those Asiatic southern continental domains where the basic ancient culture exists or does it constitute an area influenced by this practice, which came from China during a more recent period? In order to decide which of these hypotheses is the correct, it is first of all necessary to clearly describe, in as detailed a fashion as possible, the different modes of burial through following the method recommended by field-anthropology as developed nowadays in South-East Asia (Coupey et al., 2010; Harris, 2010; Pautreau et al., 2010; Willis and Tayles, 2009).

8. Conclusion

It is not a question here of establishing definitive conclusions regarding the Laang Spean site for which excavations have only just re-started after years of abandonment; nor is it a question of finalising conclusions regarding Neolithic Cambodia as a whole which remains little known in terms of chronology and of the nature of objects which are characteristic of it. It is necessary today to take stock of new data which is susceptible of contributing to a chronological base of information, preferably through direct dating of individual burials rather than on the basis of dating obtained from the ensemble of pottery grave goods offerings or any organic material from the graves. This is the case with this first grave at Laang Spean, described as a whole. Taking into consideration all of the funereal elements known in the region, with the coming of cemeteries and of areas devoted to burials away from habitations around 4450–3450 BP in close-by North-East Thailand (Higham, 2004), and taking into account the presence of several individuals and also the existence of a fitted-out grave discovered during our recent excavations, the Laang Spean cave can be considered as a burial site cave and this raises the question of whether the cave was used for this sole activity or not in Late Neolithic times. Further excavations could bring an answer to this question but regarding funereal practices and their evolution in the region, only field-anthropology based studies could satisfy this aim.

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