

# *Southeast Asia Bioarchaeology Newsletter*

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Welcome to the third annual newsletter designed to update you on the latest news in the field of bioarchaeology in Southeast Asia.

## *News*

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### NEWS FROM THE UNIVERSITY OF HAWAII, HONOLULU

Michael Pietrusewsky, Rona Ikehara, and Michele Toomay Douglas presented a paper at the 18<sup>th</sup> Congress of the Indo-Pacific Prehistory Association (IPPA) Congress in Manila, Philippines, March 20-26, 2006, entitled "The Bioarchaeology of the Vat Komnou Cemetery, Angkor Borei, Cambodia". Approximately 60 inhumation burials, of varying states of completeness and preservation, dated between 200 B.C. and A.D. 400 (or the early historic period in the Mekong delta) were excavated at the Vat Komnou cemetery Angkor Borei, Cambodia, by the University of Hawaii and the Royal University of Fine Arts in 1999 and 2000. The cemetery contained the remains of all age groups from infants to old adults. Over 40% of the burials are subadults. Adult males outnumber females 2 to 1 and most of the adults died as young adults. Osteological analyses are beginning to provide us with our first glimpses of these protohistoric people, associated with early Khmer culture, including evidence of health, disease, physiological stress, injury, physical activity, subsistence, length of life, and cultural modification of bone and teeth. Among the findings are tooth caries, moderate to extreme tooth attrition, and evidence of periodontal disease. Possible cultural modifications of the teeth include staining of the tooth enamel most likely due to chewing betel nut and tooth filing. Healed fractures of the cranium and the infracranial skeleton, although rare, were also observed. Comparisons with other skeletal series from Southeast Asia provide regional context for these preliminary observations.

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### HUMAN OSTEOLOGICAL NEWS FROM CAMBODIA

#### *Introduction*

As part of a Royal University of Fine Arts (RUFA) and Heritage Watch initiative to provide field work experience for senior Cambodian students I assisted in a field school managed by Dougal O'Reilly

and Kyle Latinis in Thmar Puok, north western Cambodia in January this year. My purpose here is to briefly report on some Iron-Age human skeletal material recovered from several garden plots that had been discarded by locals in the course of looting their own land for saleable archaeological artefacts.

### ***Aims***

A day spent travelling to a number of villages in the Thmar Puok region alerted us to the presence of not only extensive (measured in hundreds of hectares) looting of putatively Iron-Age sites, but also the abandonment and sometimes deliberate curation of human skeletal remains recovered in the process of looting. At one village, Koh Krabas, about a half hour drive from Thmar Puok village, we asked the villagers if we could collect human material from several “dumps” of material around the village. The locals were more than happy to oblige and the collected bones were taken back to our camp in Thmar Puok for further study. Over a period of two weeks I oversaw the cleaning and reconstruction of these remains. The aim of this work was to determine what, if any, meaningful biological information could be recovered from looted and subsequently discarded human remains.

### ***Skeletal Description***

While reconstruction of the material is preliminary, some basic bioarchaeological data was recovered in the field. Further work on the material will be carried out by a student of mine in collaboration with RUFA later this year. With the exception of the hyoid, ear ossicles and various metacarpals, carpals, metatarsals and tarsals every bone was represented in the sample. A minimum number of 14 individuals are represented by these remains. This is a simple count based on the greatest number of any sided skeletal element present. Both the humerus and femur gave an identical MNI in this case, which is not unexpected given the greater relative robusticity of these bones. A more sophisticated determination of MNI will be carried out later with the employment of bone element matching. To date, only the sufficiently preserved *os coxae* have been sexed. Six left and six right (not necessarily matching) *os coxae* could be sexed: 4 left female, 2 right male; 3 left female, 3 left male-which suggests an even sex distribution. Of the preserved *os coxae*, 3 left bones and one right (matches one of the left) was subadult. Two of the subadults were aged less than their early teens as there was a lack of fusion of the 3 innominate sections. Again, work is planned for later this year to develop a clearer and more accurate age profile of the sample. Nonetheless, clearly adults and children, as well as both sexes, are represented in these remains.

### ***Stature***

A number of bones could be reconstructed to provide stature estimates, although information on height by sex will need to await further study. The following bones provided stature estimates:

Femur max length: 444mm (male?), height=163.9 +/- 3cm

Femur max length: 440mm (male?), height= 162.8 +/- 3cm

Humerus max length: 298mm, height=Female 156cm, Male 160cm

Radius max length: 247mm, height=Female 158.6cm, Male 164.6cm

Radius max length: 253mm, height=Female 160.2cm, Male 166.6cm

Ulna max length: 269mm, height=159.9cm, Male 166.9cm

These height estimates are consistent with the stature of modern Cambodians.

### ***Physiological Wellbeing***

Twelve individuals were represented by near complete through to quite fragmentary frontal bones and 10 of these individuals could be assessed for cribra orbitalia (a condition often associated with anaemia and/or scurvy). Interestingly, no evidence for this physiological stress indicator was observed. Linear enamel hypoplasia affected only 1/14 individuals with assessable remains. In summary, it would

appear, from these very preliminary findings, that the people living at Koh Krabas in the Iron-Age were not particularly physiologically challenged.

### ***Dental Health***

Of the 14 individuals with assessable dental structures (mandibles and maxillae) only one individual displayed signs of (possibly) periodontal disease in the form of extensive sub-periosteal bone deposition on the buccal aspect of the right mandibular body (left side missing). No cases of dental abscessing (alveolar defects or granuloma) were observed in any individual. Slight to moderate levels of calculus deposition was seen on the dentitions of eight individuals. The only evidence of a carious lesion was in the lower left M3 of the same individual that displayed signs of enamel hypoplasia (3 severe linear bands to the right mandibular canine).

### ***Cultural Modifications***

Three of 4 individuals with assessable (near complete) maxillary arcades showed evidence for the deliberate antemortem removal (ablation) of the left and right lateral maxillary incisors. Intriguingly, a form of mock tooth ablation is still practiced in Cambodia today as part of the marriage ritual. However, the reasons behind tooth ablation in Iron-Age Cambodia can only be speculated upon.

### ***Conclusions***

While this report is brief and lacks specific quantifiable results for the most part, important preliminary insights into the biology of the people living at Koh Krabas some 2000 years or so ago have been gleaned. The aims of this study were achieved in that meaningful insights into the biology of looted samples was found to be possible. Further research on these remains will help clarify the bioarchaeology of this sample and of aspects of health, disease and behaviour of further remains (looted or not) from this under-researched region of Cambodia.

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### **KRASANG THMEY, NORTHWEST CAMBODIA: SKELETAL REPORT**

In July 2005 I visited the Royal University of Fine Arts in Phnom Penh to finalise the analysis of the Phum Snay skeletal material and, at the request of Mr Sok Keosovanara from the Nara National Research Institute for Cultural Properties, and with the approval of Professor Khum Sorith, Faculty Dean, I undertook the analysis of skeletal material from Krasang Thmey. Krasang Thmey is located in Northwest Cambodia not far from Phum Snay and was excavated in 2003 and 2004. Preliminary evidence suggests a date of between 1<sup>st</sup> BC to 4<sup>th</sup> AD for the burials excavated (see Sok Keosovanara's 2006 IPPA abstract). I analysed eight individuals, all adults (2 males, 3 females and 3 of indeterminate sex), but the extremely poor preservation of the bone severely inhibited the amount of information obtainable. A small dental sample was analysed and showed 14.5% of teeth had evidence of caries, higher than that of Phum Snay (11.7%, see Honan 2005 abstract below). Interestingly, there were at least three individuals with evidence for non-pathological, probably intentional, loss of the anterior dentition, similar to that seen in Phum Snay people, including removal of the four mandibular incisors.

### **VISIT TO HANOI ARCHAEOLOGY INSTITUTE**

In July 2005 I was also warmly welcomed at the Archaeology Institute of Vietnam in Hanoi to undertake analysis of the subadult material we had previously excavated during January 2005 from the site of Man Bac in northern Vietnam. The subadult material (those aged less than 16 years), comprising

19 of the 33 burials (58%), were predominantly in a remarkable state of preservation. Twenty-seven percent of the subadults were aged less than 5 years of age, and 18% were less than 1 year of age. It is hoped that publication of these results in combination with the adult remains will be forthcoming. This will be a combined effort with Nguyen Kim Thuy, Nguyen Lan Cuong, Marc Oxenham and Hirofumi Matsumara.

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#### REPORT ON 2006 FIELD SEASON, BAN NON WAT, THAILAND

A fifth and penultimate field season was held at the site Ban Non Wat, Amphur Non Sung, Nakhon Ratchasima, northeast Thailand by the project team lead by Prof. Charles Higham of the University of Otago, Dunedin, New Zealand and Dr Rachanie Thosarat of Bangkok. The season began in December 2005 and continued to the mid March 2006.

The excavation again extended the large square that had been excavated over the previous seasons. This is now the largest areal excavation to date in Thailand. The deposits contained habitation, workshop and cemetery remains.

As in previous seasons the distribution, preservation and completeness of burials in the new area was variable. The number of burials identified now totals 470, with 163 added this season, ranging in age from neolithic to iron age, with highly variable richness of grave goods and representation of age and sex groups over that time. The site continues to amaze us, with each season bringing up new and fascinating finds. We were delighted to find more iron age burials this season, although the intercutting of graves and breaking of ceramics over the body meant that there was considerable disturbance and damage. Another exciting find, as we reached the bronze age burials, was to discover a corner of the cemetery devoted to infant and child burials, with at least 12 in the area. There were also infants in large burial jars.

There is much post-excavation work to be done on this collection. Sian Halcrow will be visiting Thailand for the second half of this year as a Research Fellow beginning the data collection from infants and children. I hope to also visit Thailand at some point during the second half of the year, and plan to spend the second half of 2007 working on the adult material, with postgraduate students.

This season I was again assisted by postgraduate students Anna Willis from the University of Otago, Diana Leach from the University of South Australia, Helen Cekalovic from James Cook University (Queensland, Australia) and Michelle Wright from the Australian National University. Thai archaeologist Chanakarn Hongtong (Daeng) as usual showed us how to excavate human skeletons to the highest standard and some of the villagers of Ban Non Wat have become very skilled also. Dr Rachanie Thosarat generously worked with us when she was able to get away from her directorial duties. As I noted in the previous newsletter, I would very much like to work with more Thai bioarchaeologists and would be pleased to hear from any prospective students who are keen to develop their skills in this field of archaeology.

**From: Ms Anne-Sophie Coupey, J.-P. Pautreau, E. Rambault, Aung Aung Kyaw**

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HTAN TA PIN, AN IRON AGE SITE (PYAW BWE TOWNSHIP, MYANMAR)

In January-February 2006, a dig was carried out on the site of Htan Ta Pin, by Myanmar and French archaeologists. The site is located in Pyaw Bwe Township, very close by Ywa Htin site (7-8 km), excavated in 2002-2003. Thirty-six graves were discovered. Some of them do not have preserved bone and were only identified by grave goods. Others, more or less complete, were those of 17 adults and 6 children. They were buried in a supine position, oriented East-West, head to the East. All were single primary burials but some rearrangement of bones, post decay, has been noted. For example, there was a reduction of the corpse where bones were put in order but only taking up as much space as half a body. The skull was placed to the East and legs to the west as with other burials. Another grave had the rearrangement of lower limb bones, without saving of place. The rearrangement of an older skeleton seems to have occurred when a new body is buried in the same pit or the same coffin.

Skeletons do not show signs of restriction due to a narrow coffin but seem to be held in position by the pit walls (or quite a large coffin with a flat bottom). Evidence for wooden coffins has been shown in other sites of the Samon valley (Ywa Htin and Myo Hla). Children were buried in the same way as adults. No burial jars were discovered.

The main type of grave goods were pottery vessels (containing foodstuffs which had disappeared) placed at the feet of the burials. Recurring shapes are cylindrical pots, spherical pots and shallow bowls. Deposits of animal flesh (bovine) were often placed on or next to the lower parts of the body. Neither bronze nor iron implements were discovered during excavations but some were found by villagers (iron spearhead and blade of sword). Carnelian and glass beads were the most representative of the body ornaments discovered (necklaces, bangles and maybe belts). A few deceased were privileged as evidenced by a child who wore two glass bracelets and three bone bracelets and an older person who wore green glass earrings.

Research at Htan Ta Pin confirm our first comments about the Samon valley. Every site excavated by our team from 2001 shows a majority of graves with modest grave goods but also exceptional objects of Yunnanese influence (metallic items) and Indian influence (carnelian beads). Samon was, during the Iron Age, a major road between south China and Indian Ocean.

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## 1. DENTAL METRICAL DATA FROM THE ORANG ASLI, MALAYSIA, AVAILABLE ON THE WEB

In 1999 I collaborated with dentists from the University of Malaya and archaeologists from Malaysia's Department of Museums and Antiquities to collect dental casts of 211 male and female Orang Asli subjects in Peninsular Malaysia. The Orang Asli (= Original People) groups which were surveyed included Batek and Jahai (Semang), Temiar (Senoi), and Semelai and Temuan (Aboriginal Malays). The participating dentists, from the Department of Community Dentistry at the University of Malaya, recorded the oral health of the subjects, an exercise which also screened out those whose state of dental health precluded taking casts without detriment to the subjects, and then prepared the dental moulds of fit subjects when they consented to this second stage in the examination. One set of casts is retained at the University of Malaya and the other set was transported to the School of Archaeology and Anthropology at the Australian National University. The participating dentists were Professor Rahimah Abdul Kadir, Dr Zamri Radzi, Dr Daw Mohammad Suessi and Dr Paula Nuti Pontes. Adi Haji Taha, then Director of Archaeology at the Department of Museums and Antiquities, coordinated the logistics including the provision of Museum vehicles and driver, and volunteering Mahfuz Nordin who collected ethnographic information and generally assisted the field logistics.

Recording and analysis of the dental morphology followed fairly quickly, with Daniel Rayner's submission in 2000 of his Bachelor of Arts Honours thesis at the Australian National University on this topic. In 2002 Adam Lauer submitted his Master of Arts thesis (also at the ANU) which included tooth measurements of the male Semang and Temiar as part of his analysis of osteological evolution amongst Malay Peninsula populations during the Holocene. Subsequently I measured all of the Orang Asli teeth, and prepared an analysis of the inter-observer variation between my measurements and those of Adam Lauer. The measurements I recorded are now publicly available as pdfs of Excel spreadsheets on a website I have designed to broadcast this information.

There are two linked web pages relevant to users who may be interested in using this information, and which include documents and references to the work described above.

David Bulbeck (2005) Study into Malay Peninsula Aborigines' Dental Differentiation. Including my 1999 field report with Rahimah Abdul Kadir, and Daniel Rayner's BA Honours thesis, as pdf links. [http://arts.anu.edu.au/bullda/dental\\_differentiation.html](http://arts.anu.edu.au/bullda/dental_differentiation.html)

David Bulbeck and Adam Lauer (2005). Tooth Measurements and Degree of Wear of Malayan Orang Asli Dental Casts. Includes summary data on the tooth measurements, and the original odontometric observations as pdf links. [http://arts.anu.edu.au/bullda/Bulbeck\\_Lauer\\_report.html](http://arts.anu.edu.au/bullda/Bulbeck_Lauer_report.html)

## 2. RECENT DEVELOPMENTS IN MALAYSIA'S PALAEOANTHROPOLOGY

In recent years there have been two major developments in Malaysian palaeoanthropology which are worth being brought to the attention of readers of the newsletter. (I would like to thank Ryan Rabett of the McDonald Institute for Archaeological Research, Cambridge University, for his advice on certain details regarding the second of these two developments.)

1) In mid-2005, Professor Zuraina Majid, then Director of the Centre for Archaeological Research at the University of Science Malaysia, completed the production of her edited volume titled *The Perak Man and other Prehistoric Skeletons of Malaysia*. It is a major volume which, for the first time, provides an overview of the recovery and analysis of human remains from archaeological sites in Malaysia. The following list of chapters and contributors conveys a sense of the book's scope.

Zuraina Majid (ed.). 2005. *The Perak Man and other Prehistoric Skeletons of Malaysia*. Pulau Pinang: Penerbit Universiti Sains Malaysia. Distributed by the Universiti Sains Malaysia Co-operative Bookshop, Universiti Sains Malaysia, 11800 USM Pulau Pinang, Malaysia.

*Chapter 1.* Zuraina Majid. The excavation and analysis of the Perak Man buried in Gua Gunung Runtuh, Lenggong, Perak.

*Chapter 2.* Teuku Jacob and Agus Soepriyo. A palaeoanthropological study of the Gua Gunung Runtuh skeleton.

*Chapter 3.* Hirofumi Matsumura and Zuraina Majid. The Perak Man: morphology, osteometric analysis and palaeopathology.

*Chapter 4.* Loh Hong Sai. Dentofacial features of the Perak Man.

*Chapter 5.* A.R. Samsuddin and Nizam A. Craniofacial analysis of the Perak Man using CT-scan data and 3-D craniofacial reconstruction model.

*Chapter 6.* Jamaluddin Mohamad. The Gua Gunung Runtuh skeleton: impressions of an orthopaedic surgeon.

*Chapter 7.* Stephen Chia. The preservation of the Perak Man.

*Chapter 8.* Mokhtar Saidin. Cave formations of sites with skeletal remains in Lenggong, Perak.

*Chapter 9.* John Krigbaum and Ipoi Datan. The Deep Skull and associated human remains from Niah Cave.

*Chapter 10.* Zuraina Majid and Luz-Andrea Pfister. The Niah collection of 122 skeletons at the University of Nevada.

*Chapter 11.* John Krigbaum and Jessica Manser. The West Mouth burial series from Niah Cave, past and present.

*Chapter 12.* Zuraina Majid, Aaron Lim, Johan Arif, A.R. Samsuddin, Nizam A., Zafarina Z., and Norazmi M.N. Niah 1977: a skeleton with bilateral absent radius.

*Chapter 13.* Jeffrey Abdullah. Human teeth of the Palaeolithic period from Gua Balambangan, Sabah.

*Chapter 14.* Stephen Chia, Johan Arif and Hirofumi Matsumura. Dental characteristics of prehistoric human teeth from Melanta Tutup, Sabah.

*Chapter 15.* David Bulbeck. The Gua Cha burials.

*Chapter 16.* David Bulbeck and Adi Taha. A description and analysis of the Gua Peraling human remains.

*Chapter 17.* Zuraina Majid, Johan Arif, A.R. Samsuddin, Nizam A., Aaron Lim, Mokhtar Saidin, Jeffrey Abdullah and Stephen Chia. GTK1: a skeleton from Gua Teluk Kelawar, Lenggong dated 8,400 ± 40 bp.

*Chapter 18.* Stephen Chia and Zolkurnian Hassan. Gua Harimau: a prehistoric cemetery in Lenggong, Perak.

*Chapter 19.* David Bulbeck. The Guar Kepah human remains.

*Chapter 20.* Hirofumi Matsumura. Bioanthropological significance of prehistoric human skeletal remains in Malaysia.

*Chapter 21.* Stephen Oppenheimer. The significance of the Orang Asli and their possible relationship to the Pleistocene peoples of the Malay Peninsula and to the colonisation of the world: a genetic perspective.

2) The second major development of interest is the deposition in late 2005 of approximately half of the excavated human remains from Gua Cha at the McDonald Institute for Archaeological Research, Cambridge University. These remains had been held onto since 1954 by the main excavator of the site, Gale Sieveking, following an agreement with the Duckworth Laboratory (Cambridge University) which essentially saw the cranial material deposited at the Duckworth and the postcranial material retained by Sieveking. With Gale Sieveking's health seriously deteriorating, his wife, Ann Sieveking, decided to deposit his excavation notes and other materials from the 1954 Gua Cha excavation at the McDonald Institute, where Ryan Rabett, a postdoctoral fellow at the Institute, has taken responsibility for their temporary storage. In particular, the skeletal remains have been deposited at the McDonald to expedite their documentation in preparation for repatriation to Malaysia later this year (2006).

Between 14<sup>th</sup> and 18<sup>th</sup> February, Ryan Rabett, Mokhtar Saidin (now Director of the Centre for Archaeological Research at the University of Science Malaysia), and I identified, recorded and photographed the skeletal remains, and packed the identified elements in preparation for transport to Malaysia. This joint exercise was based on Ryan Rabett's preliminary observations on the ten boxes of remains deposited by Ann Sieveking, and also incorporates Ryan's observations on the tenth box which we had not inspected together before time ran out. The remains that we documented are predominantly postcranial but include small amounts of cranial material. Most of the skeletons are pre-Neolithic ("Hoabinhian") but some are Neolithic. They constitute a major contribution to our knowledge of prehistoric human remains from Peninsular Malaysia, being by far (in combination with the skeletal material, still held at the Duckworth Laboratory in what is now the Leverhulme Centre for Human Evolutionary Studies) the largest known assemblage of such remains.

Time did not permit cleaning or reconstruction of the human remains beyond that necessary for identification purposes. Final treatment of the skeletal material will occur in Malaysia, following repatriation. Professor Zuraina Majid, recently appointed as Commissioner for Malaysia's Heritage Resources, is planning an exhibition at Muzium Negara, Kuala Lumpur of the human remains from Gua Cha and other major archaeological sites in Peninsular Malaysia. On current expectations she will be visiting the McDonald Institute in coming months to collect the material for its return journey to Malaysia, at which time she should also finalise negotiations with the Duckworth Laboratory to borrow the most complete Gua Cha skulls there for the exhibition.

## ***Graduate Student Projects***

### **STABLE ISOTOPIC ANALYSIS OF CARBON AND NITROGEN AS AN INDICATOR OF PALEODIETARY CHANGE AMONG PRE-STATE METAL AGE SOCIETIES IN NORTHEAST THAILAND**

*PhD Thesis*

**Christopher King**

**University of Hawai'i, Honolulu.**

Supervisor: Michael Pietruszewsky

This is the first extensive work to apply stable isotope analyses to questions of diet in mainland Southeast Asia. Stable isotopes of carbon ( $\delta^{13}\text{C}_{\text{collagen}}$  and  $\delta^{13}\text{C}_{\text{apatite}}$ ) and nitrogen ( $\delta^{15}\text{N}_{\text{collagen}}$ ) are used to infer dietary patterns in northeast Thailand during the pre-state Metal Age (2000 B.C. to A.D. 500). It is hypothesized there are distinct differences among the populations during this time period which coincide with human induced environmental changes and developments of alternative subsistence technologies. It is further hypothesized that male and female diets differed, possibly from social conditions of sex related food accessibility. Archaeological skeletal series come from Ban Chiang, Ban Na Di, Ban Lum Khao, and Noen U-Loke. Isotopic analysis of local flora and fauna provided a baseline for interpreting stable isotopic data from human samples for this and future studies of paleodiet.

Isotopic results of temporal variation (sexes combined) show a statistically significant positive shift in  $\delta^{13}\text{C}_{\text{collagen}}$ ,  $\delta^{15}\text{N}_{\text{collagen}}$ , and  $\delta^{13}\text{C}_{\text{apatite}}$  values. Both time periods have individuals with varied diets consisting principally of  $\text{C}_3$  plants,  $\text{C}_3$  terrestrial animals along with freshwater fish.

During the second millennium B.C., there is a statistically significant difference between the sexes for  $\delta^{15}\text{N}_{\text{collagen}}$  values, demonstrating a consolidation of protein resources (suggesting increased reliance on domesticated animals for both sexes) with a wider variety of protein sources for females than males.

During the first millennium B.C.,  $\delta^{15}\text{N}_{\text{collagen}}$  and  $\delta^{13}\text{C}_{\text{apatite}}$  values between females are more positive, a statistically significant amount suggesting an increase in open field carbohydrate foods as well a greater consumption of pond/river fish. The  $\delta^{13}\text{C}_{\text{apatite}}$  values are observed to be statistically different between the sexes with females consuming more varied sources of plant food than males whose values change significantly over time (suggesting they were consuming more domesticated animals with less emphasis on wild game).

These stable isotopic data substantiate archaeological and paleoenvironmental evidence and corroborates bioarchaeological information from paleodemography and dental paleopathologies, suggesting changes in dietary patterns over time and between the sexes. The use of stable isotopes from human remains from northeast Thailand has provided direct indication for diet change from pre-state Metal Age societies.

*Chris will defend his PhD thesis on the 19<sup>th</sup> April.*

## OSTEOARTHRITIS AT PHUM SNAY (IRON AGE CAMBODIA), A COMPARATIVE STUDY

*Bachelor of Science with Honours in Archaeology*

**Rachel Shoichet**

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Supervisor: Kate Domett

The goal of this project is to examine the evidence of osteoarthritis in Iron Age Phum Snay, Cambodia and to study the occurrence of the disease in association with different periods and varying environmental factors in order to determine what conclusions may be drawn from archaeological records and remains regarding the causes and incidence of osteoarthritis.

The surfaces and the joints that make up the appendicular skeleton were used to examine the overall patterns and prevalence of osteoarthritis. The sample consisted of a total of 415 fragments recovered from ossuaries at Wat Rajabo and Wat Leu, and 17 skeletons excavated from Phum Snay (Phum Snay Excavated). The Phum Snay Excavated data was compared to five sites reflecting varying periods and diverse locations. The sites used for comparison are Metal Period Viet Nam (Northern Viet Nam)<sup>1</sup>, Ban Lum Khao (Bronze Age Northeastern Thailand)<sup>2,3</sup>, Khok Phanom Di (Neolithic, Southeastern Thailand)<sup>3</sup> and Con Co Ngua (Da But Cultural Period, Northern Viet Nam)<sup>1</sup> (<sup>3</sup>Domett, 2001; <sup>2</sup>2004; <sup>1</sup>Oxenham, 2000). Analysis of data collected from the Phum Snay sample demonstrated that fossil remains exhibited higher frequencies of osteoarthritis on the right skeletal side, and that the wrist area exhibited the highest overall occurrence of pathological osteoarthritis. In contrast, examination of the pattern of osteoarthritis in the five comparison sites reflects the highest prevalence of osteoarthritis at the elbow joint for all of the sites, with the exception of Khok Phanom Di.

Finally, the roles of age, diet, genetics, lifestyle, and cultural differences were examined in regard to considering the patterns, prevalence, and aetiology of osteoarthritis and whether evidence of disease is a valid predictor of occupation, diet and social organization and or lifestyle, and if so to what extent.

*Rachel will submit her Hons thesis in the next few weeks.*

## THE CARIES OF PHUM SNAY

*Bachelor of Science with Honours in Archaeology*

**Zoe Honan**

**James Cook University, Townsville, Australia.**

Supervisor: Kate Domett

Caries prevalence has been demonstrated globally to be related to diet. An increase in caries prevalence has been associated with the adoption of agriculture globally with the exception of South East Asia. South East Asia has demonstrated a trend for decreasing caries prevalence with the adoption of rice agriculture.

The dentition from Phum Snay, in north-eastern Cambodia was used for analysis due to the nature of the skeletal material for the site. The site had been looted and the bulk of the skeletal material was severely disarticulated making an analysis of the teeth one of the few methods to extract scientific data from the assemblage. The teeth were examined for the prevalence of caries to determine if the trend of a decreasing caries rate in South East Asia continued over time.

Phum Snay contradicted the proposed trend in South East Asia by returning caries rates that were considerably higher than the other sites in South East Asia. The difference in the caries rates between the sexes is demonstrated at Phum Snay with the females being considerably higher than the males. The data from Phum Snay asks more questions than it answers, providing ideas for future work in the region in order to try and understand the results from this site.

*Zoe submitted her thesis at the end of 2005.*

## CHILDHOOD STRESS OF AN IRON AGE POPULATION FROM TAIWAN: USING LINEAR ENAMEL HYPOPLASIA AND POROTIC HYPEROSTOSIS AS STRESS INDICATORS

Master of Arts

**Chin-Hsin Liu**

**Graduate School, University of Florida**

Supervisor: John Krigbaum

The growth and development trajectory of an individual is a direct reflection of his/her stress load. At the population level, patterns of stress load have been used to assess the overall well-being of a group. Childhood stress, reflected by morbidity and mortality, is particularly useful in understanding how well a population is adapted to their environment. Interaction between environmental perturbations (various stressors) and host response may result in a number of skeletal defects which can serve as indicators of stress events during the course of an individual's life. In this study, linear enamel hypoplasia (LEH) and porotic hyperostosis are selected as stress indicators used to assess the health status of a skeletal population from Iron Age Taiwan. The distribution of stress markers by age and sex is here interpreted in biocultural context. Potential insults that induce stress are addressed with respect to how the population interacts with its environment and its overall biocultural milieu.

The Shih-san-hang (SSH) site dates to 2,000 to 500 years B.P. The site is characteristic for its locally innovative iron-smelting tradition and iron craftsmanship. The skeletons of 306 recovered individuals from SSH are analyzed in this study. Basic demographic information and scored pathologies are used to assess prevalence and timing of LEH and porotic hyperostosis by sex and age. Results suggest that the SSH people had a fairly stressful childhood based on incidence of LEH. The peak age of LEH formation occurs between 2 to 5 years. Weaning-related stressors, such as contaminated food and water, prolonged breast-feeding, and low quality weaning diet, are all possible causes for the LEH observed. Females are more stressed than males, as indicated by significantly higher LEH prevalence and greater average LEH counts, and age of peak LEH formation occurs later in females than males. These two observations may reflect cultural conceptions and bias by sex suggesting male preference and/or differential weaning practice. LEH is more common among subadults and young adults which is indicative of higher morbidity due to an impaired immune system during early childhood.

Prevalence of porotic hyperostosis, an indicator of iron-deficiency anemia, suggests greater impact of the condition among individuals in late subadulthood and early adulthood. Both sexes are similarly at risk in suffering from anemic stress. Parasitic infection due to marine-oriented subsistence and/or poor hygiene are possible etiologies. The occurrence of LEH and porotic hyperostosis does not overlap by age, which suggests that the two markers are independent of one another. Overall, the SSH inhabitants had stressful childhoods, however, once individuals reached adulthood their health status improved.

*Chin-Hsin Liu submitted her thesis in 2005.*

# MORTUARY PRACTICES OF PREHISTORIC NORTHEAST THAILAND - EVIDENCE FROM THE PERSPECTIVE OF FIELD ANTHROPOLOGY

Master of Science

**Anna Willis**

**University of Otago, New Zealand**

Supervisor: Nancy Tayles

Burials from archaeological sites contain important information about distinctions between individuals. Differences in the orientation of a burial or the placement and position of individuals suggest that the members of a community interred their dead in a specific and intentional manner, which may have reflected the individual's position in society, their sex, age or lineage. To form the most comprehensive understanding of mortuary practices a strong communication is required between archaeologists and biological anthropologists. Field anthropology is a method developed by the French that supports this principle. Combining archaeological, osteological and taphonomic information the original position of the body is conceptualised to assist in understanding the context in which individuals were interred, in a coffin, in a cloth wrapping or in the ground.

There has been a theme observed in the mortuary practices in the Mun River Valley, in late prehistory in Northeast Thailand, with the majority of individuals lying in an extended supine position. However, there are some burials with unique characteristics indicating differential practices not only within sites but also between them.

The aim of this thesis was to undertake a comparative analysis of the positions of individuals as a reflection of the mortuary practices of three sites from Northeast Thailand: Ban Lum Khao, Noen U-Loke and Ban Non Wat. Collectively, these cover the period from the Neolithic to the Iron Age, c.2100BC-500AD providing a good base for investigating regional and temporal differences.

A number of objectives were undertaken to achieve this aim. Firstly, to assess whether there were differences in the position of the limbs and extremities between the subadults, males and females and young, middle and old aged adults. Secondly, to assess whether there were differences within the sites or between them. Finally, the positions were interpreted from the perspective of field anthropology to assess whether there were identifiable differences in the burial context.

The majority of individuals at all three sites were interred in an extended, supine position. There were few differences in position between subadults, males and females or between the age ranges at any of the sites. Overall, there were also few differences in the position of individuals within or between the sites. The majority of individuals at all sites were buried with their knees extended, and their elbows extended or loosely flexed. There were only subtle differences seen in the positions of the hands and feet, however these reflected the way they were interred.

The interpretation from field anthropology suggest that the majority of individuals were interred in a tight wrapping and that differences between their positions, which correlate to the Bronze and Iron Ages were a reflection of either the durability of the wrapping or practices associated with the time between the death of an individual and their internment. The only individuals that differ from this are the very rich Bronze Age burials at Ban Non Wat. The majority of these were not tightly wrapped and were interred in wider graves than the rest of the individuals and one appears to have been buried in a coffin.

*Anna submitted her thesis in December 2005.*

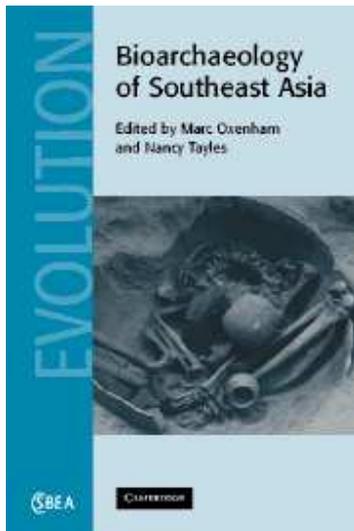
## ***Recent Publications***

- **BIOARCHAEOLOGY OF SOUTHEAST ASIA**

Oxenham, M. and N. Tayles (editors)

Series: [Cambridge Studies in Biological and Evolutionary Anthropology](#) (No. 43)

<http://www.cambridge.org/uk/catalogue/catalogue.asp?isbn=0521825806>



Bioarchaeology of Southeast Asia is the first book to examine the biology and lives of the pre-historic people of this region. Bringing together the most active researchers in late Pleistocene/Holocene Southeast Asian human osteology, the book deals with major approaches to studying human skeletal remains. Using analysis of the physical appearance of the region's past peoples, the first section explores issues such as the first inhabitants of the region, the evidence for subsequent migratory patterns (particularly between Southeast and Northeast Asia) and counter arguments centering on in situ microevolutionary change. The second section reconstructs the health of these people, in the context of major economic and demographic changes over time, including those caused by the adoption or intensification of agriculture. Written for archaeologists, bioarchaeologists and biological anthropologists, it is a fascinating insight into the bioarchaeology of this important region.

## CONTENTS

Preface; Foreword; 1. Introduction: Southeast Asian bioarchaeology: past and present Nancy Tayles and Marc Oxenham; 2. The population history of Southeast Asia viewed from morphometric analyses of human skeletal and dental remains Hirofumi Matsumura; 3. A multivariate craniometric study of the prehistoric and modern inhabitants of Southeast Asia, East Asia and surrounding regions: a human kaleidoscope? Michael Pietrusewsky; 4. Interpretation of craniofacial variation and diversification of East and Southeast Asians Tsunehiko Hanihara; 5. New perspectives on the human peopling of Southeast and East Asia during the late upper Pleistocene Fabrice Demeter; 6. Human variation and evolution in Holocene Peninsular Malaysia David Bulbeck and Adam Lauer; 7. Batak dentition, Palawan Island, Philippines: Southeast Asian Negrito origins Christy G. Turner II and James F. Eder; 8. Non Nok Tha people: an assessment of dental pathological conditions Michele Toomay Douglas; 9. Human biology from the bronze age to the iron age in the Mun River Valley of Northeast Thailand Kate Domett and Nancy Tayles; 10. Paleodietary change among pre-state metal-age societies in Northeast Thailand: a study using bone stable isotopes Christopher King and Lynette Norr; 11. The oral health consequences of the adoption and intensification of agriculture in Southeast Asia Marc Oxenham, Nguyen Lan Cuong and Nguyen Kim Thuy; 12. Cranial lesions on the late Pleistocene Indonesian Homo erectus Ngandong 7 Etty Indriati; 13. 'The predators within': investigating the relationship between malaria and health in the prehistoric Pacific Islands Hallie Buckley; 14. Conclusions: synthesising Southeast Asian population history and paleohealth Marc Oxenham and Nancy Tayles.

- **DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS IN LATE JOMON**

M. F. Oxenham, H. Matsumara, and T. Nishimoto.

International Journal of Osteoarchaeology 16: 34–46 (2006)

**ABSTRACT:** The purpose of this study is to describe and analyse the evidence for diffuse idiopathic skeletal hyperostosis (DISH) in samples of human skeletal material recovered from Late Jomon (ca. 1500–300 BCE) and Okhotsk (CE 500–900) cultural period sites, northwestern Hokkaido, Japan. Two individuals from the Jomon period assemblage (n¼14) exhibited lesions consistent with DISH, while the larger Okhotsk sample (n¼39) was free of this condition. The aetiology of this condition is reviewed with reference to the clinical and bioarchaeological literature, in addition to behavioural and environmental considerations specific to this region and these time periods.

**KEYWORDS:** DISH; Jomon; Okhotsk; vertebral trauma

- **FREQUENCY, LOCATION, MORPHOLOGY AND AETIOLOGY OF OSSEOUS MANDIBULAR CONDYLAR CONCAVITIES.**

M. F. Oxenham and J. Whitworth

International Journal of Osteoarchaeology (in press)

Early view: Published online in Wiley InterScience ([www.interscience.wiley.com](http://www.interscience.wiley.com)).

**ABSTRACT:** The aim of this study was to examine the morphology, frequency, location and aetiology of osseous concavities (OC) in the mandibular condyle. The temporomandibular joints of 435 skeletonised individuals of known age, sex and ancestry were macroscopically examined for osseous concavities and signs of osteoarthritis. Descriptive statistics (<sub>2</sub>) were used to compare results. It was found that OCs were present in 17.5% of the sample and did not vary by sex or ancestry. Posteriorly positioned OCs accounted for 72% of all OCs, and the frequency of OCs decreased with increasing age in contrast to the pattern seen for osteoarthritis. It is concluded that OCs are either developmental defects related to the late maturity of the condyle, and/or a function of regressive remodelling with posterior displacement of the condyle.

**KEYWORDS:** mandible; condyle; concavities; OA; remodelling; pseudopathology

- **ADULT FRACTURE PATTERNS IN PREHISTORIC THAILAND: A BIOCULTURAL INTERPRETATION**

Domett, K. and Tayles, N.

International Journal of Osteoarchaeology (in press)

Early view: Published online in Wiley InterScience ([www.interscience.wiley.com](http://www.interscience.wiley.com)).

**ABSTRACT:** The prevalence and distribution patterns of trauma in samples of human skeletal remains can reflect the risks to which the community was exposed in daily activities or as a result of interpersonal violence. This paper describes the patterns of non-vertebral fractures in skeletal samples from four prehistoric Thai sites in terms of long bone fracture rates and individual prevalence rates. The sites range in date from c. 2000 BC (Neolithic) to 400 BC (late Bronze Age), and in environment from coastal estuarine to seasonally dry upland plains. These differences in the natural and cultural environment provided a basis for comparison among the samples representing nearly 300 adult individuals. The types of fractures ranged from simple to severe, but most had healed successfully with few limiting complications. The small bones of the hands and feet as well as clavicle and forearm bones were most frequently fractured among all samples. Overall there was an increase in the major long bone fracture rates from the Neolithic (0.3%) to the Bronze Age (3.0%) that may reflect a change in subsistence activities such as land clearance for the intensification of rice agriculture. The prevalence of ulnar fractures is particularly high in the Bronze Age, and the analysis of their possible cause,

combined with evidence for craniofacial fractures, is suggestive of the presence of interpersonal violence in a small number of individuals.

KEYWORDS: Southeast Asia • Thailand, fractures • accidents • interpersonal violence

- A POSSIBLE CASE OF SPONDYLOARTHROPATHY IN A PREHISTORIC JAPANESE SKELETON

K. Inoue, W. Takigawa, M. Sato, M. Kumagai, Y. Dodo, K. Katayama

International Journal of Osteoarchaeology 15: 186–195 (2005)

ABSTRACT: Palaeopathology helps to define the migration of past diseases. Genetic and environmental factors play a role in the development of spondyloarthropathy (SpA). We report skeletal remains with SpA from the Jomon period in Japan. The skeleton is of a female who died at a young adult age. The skeleton had characteristic features seen in SpA as follows: (1) polyarticular arthritis; (2) erosions accompanying some bone formation; (3) enthesial ossification; and (4) periostitis in lower long bones. The findings suggest that SpA was present in prehistoric Japan before contact with European civilisation, and the present example of SpA is the oldest in Asia and the Old World.

KEYWORDS: spondyloarthropathy • palaeopathology • Jomon period • Japan

- PALEODEMOGRAPHY OF A MEDIEVAL POPULATION IN JAPAN: ANALYSIS OF HUMAN SKELETAL REMAINS FROM THE YUIGAHAMA-MINAMI SITE

Tomohito Nagaoka, Kazuaki Hirata, Emi Yokota, Shuji Matsu'ura

American Journal of Physical Anthropology

Early view: Published online in Wiley InterScience ([www.interscience.wiley.com](http://www.interscience.wiley.com)).

ABSTRACT: The purpose of this study is to obtain demographic data regarding the medieval population buried at the Yuigahama-minami site in Kamakura, Japan, and to detect a secular trend in the life expectancy of Japanese population over the last several thousand years. The Yuigahama-minami skeletal sample consists of 260 individuals, including 98 subadults (under 20 years old) and 162 adults. A Yuigahama-minami abridged life-table analysis yielded a life expectancy at birth ( $e_0$ ) of 24.0 years for both sexes, a life expectancy at age 15 years ( $e_{15}$ ) of 15.8 years for males, and an  $e_{15}$  of 18.0 years for females. The reliability of the estimated  $e_0$  was confirmed by analysis of the juvenility index. Demographic profiles comparing the Yuigahama-minami series with other skeletal series indicated that both the survivorship curve and life expectancy of the Yuigahama-minami sample are similar to those of the Mesolithic-Neolithic Jomon population, but are far lower than those of the early modern Edo population. These comparisons strongly suggest that life expectancy changed little over the thousands of years between the Mesolithic-Neolithic Jomon and medieval periods, but then improved remarkably during the few hundred years between the medieval period and early modern Edo period. The short-lived tendency of the Yuigahama-minami sample does not contradict the archaeological hypothesis of unsanitary living conditions in medieval Kamakura. This is the first investigation to address the demographic features of a medieval population in Japan, and will help refine our understanding of long-term trends in the demographic profiles of inhabitants of Japan.

KEYWORDS: life expectancy • medieval population • skeletal remains • Japanese • secular trend

- DENTAL PERSPECTIVES ON THE POPULATION HISTORY OF SOUTHEAST ASIA

Hirofumi Matsumura and Mark J. Hudson

American Journal of Physical Anthropology 127 (2): 192-209 (2005)

ABSTRACT: This article uses metric and nonmetric dental data to test the “two-layer” or immigration hypothesis whereby Southeast Asia was initially occupied by an “Australo-Melanesian” population that later underwent substantial genetic admixture with East Asian immigrants associated with the spread of agriculture from the Neolithic period onwards. We examined teeth from 4,002 individuals comprising

42 prehistoric and historic samples from East Asia, Southeast Asia, Australia, and Melanesia. For the odontometric analysis, dental size proportions were compared using factor analysis and Q-mode correlation coefficients, and overall tooth size was also compared between population samples. Nonmetric population affinities were estimated by Smith's distances, using the frequencies of 16 tooth traits. The results of both the metric and nonmetric analyses demonstrate close affinities between recent Australo-Melanesian samples and samples representing early Southeast Asia, such as the Early to Middle Holocene series from Vietnam, Malaysia, and Flores. In contrast, the dental characteristics of most modern Southeast Asians exhibit a mixture of traits associated with East Asians and Australo-Melanesians, suggesting that these populations were genetically influenced by immigrants from East Asia. East Asian metric and/or nonmetric traits are also found in some prehistoric samples from Southeast Asia such as Ban Kao (Thailand), implying that immigration probably began in the early Neolithic. Much clearer influence of East Asian immigration was found in Early Metal Age Vietnamese and Sulawesi samples. Although the results of this study are consistent with the immigration hypothesis, analysis of additional Neolithic samples is needed to determine the exact timing of population dispersals into Southeast Asia.

KEYWORDS: Southeast Asians • dentition • population history • Neolithic dispersals • multivariate analysis.

- DENTAL MORPHOLOGY AND THE POPULATION HISTORY OF THE PACIFIC RIM AND BASIN: COMMENTARY ON HIROFUMI MATSUMURA AND MARK J. HUDSON

Christy G. Turner II

American Journal of Physical Anthropology

Early view: Published online in Wiley InterScience ([www.interscience.wiley.com](http://www.interscience.wiley.com))

No Abstract

- MATRILOCALITY DURING PREHISTORIC TRANSITION TO AGRICULTURE IN THAILAND?

Bentley RA, Pietruszewsky M, Douglas MT, and Atkinson TC

Antiquity 79:865-881 (2005)

ABSTRACT: Stable isotopes in teeth are providing important correlations between ancient people and the geographical location of their childhood homes. In an exciting new application, the authors measure the varying signatures of strontium, oxygen and carbon isotopes in the teeth of a sequence of people buried in Thailand during the period of the introduction and intensification of agriculture. Preliminary results point to the arrival of immigrant men, followed by a change in the relationship between the sexes: the women grow up on local food, the men have access to more widespread resources. This perhaps implies a matrilineal system, where forager men raised elsewhere marry into farming communities. It provides a likely antithesis to the social consequences of introducing agriculture into central Europe.

KEYWORDS: Southeast Asia, Neolithic agriculture, marital residence, strontium isotope analysis, oxygen isotope analysis.

- RECONSTRUCTING HUMAN SUBSISTENCE IN THE WEST MOUTH (NIAH CAVE, SARAWAK) BURIAL SERIES USING STABLE ISOTOPES OF CARBON.

John Krigbaum.

Asian Perspectives: the Journal of Archaeology for Asia and the Pacific 44.1 (Spring 2005): p73(17).

ABSTRACT: The human burial series from the West Mouth of Niah Cave (Sarawak) offers a unique opportunity to explore prehistoric subsistence patterns in lowland tropical rainforest. Over 200 primary and secondary burials, classified as pre-Neolithic and Neolithic, have been recovered since preliminary

excavations began there a half-century ago. Stable isotope ratios of carbon ( $^{13}\text{C}/^{12}\text{C}$ , reported as  $\delta^{13}\text{C}$  values) derived from human tooth enamel provide a quantitative measure of individual food consumption during the time of enamel formation. Such data provide a robust and independent assessment of total diet that complements other subsistence information recovered from the archaeological record. West Mouth human tooth enamel examined shows a broad range of  $\delta^{13}\text{C}$  values ( $-15.7\text{‰}$  to  $-11.3\text{‰}$ ), consistent with a  $\text{C}_3$ -based subsistence regime as would be expected in rainforest habitats dominated by  $\text{C}_3$  vegetation. Pre-Neolithic individuals have more negative  $\delta^{13}\text{C}$  values on average ( $N = 15$ ,  $X = -14.3\text{‰}$ ) than Neolithic individuals sampled ( $N = 28$ ,  $X = -13.1\text{‰}$ ). This isotopic shift is statistically significant and suggests a fundamental change in human subsistence between the late Pleistocene/early Holocene and later Holocene inhabitants at Niah. Pre-Neolithic  $\delta^{13}\text{C}$  values suggest broad spectrum rainforest foraging, whereas less negative Neolithic  $\delta^{13}\text{C}$  values, on average, suggest a more coordinated regime of food production and/or collection. Studies of  $\delta^{13}\text{C}$  variation in rainforest habitats contribute to this interpretation, particularly with respect to the "canopy effect," whereby closed-canopy foraging predicts more negative  $\delta^{13}\text{C}$  values, while food resources consumed by exploiting more open settings (such as fields, gaps, and swamps) predict less negative  $\delta^{13}\text{C}$  values. These data have important implications for interpreting the nature of human subsistence in a rainforest setting prior to and after the potential adoption of agriculture by the inhabitants represented in the West Mouth burial series.

KEYWORDS: Niah Cave, Southeast Asia, Borneo, prehistory, late Pleistocene, Holocene, Neolithic, bioarchaeology, palaeodiet, subsistence, carbon isotopes.

- THE ORIGINS OF THE CIVILIZATION OF ANGKOR: VOLUME 1: THE EXCAVATION OF BAN LUM KHAO.

Edited by CFW Higham and R Thosarat. Bangkok: Thai Fine Arts Department. 2004.

ISBN 9744176881. Available from Oxbow books: <http://www.oxbowbooks.com/>

Ban Lum Khao is a prehistoric settlement in Nakhon Ratchasima Province, northeast Thailand. Excavations in 1995-6 revealed a cultural sequence that began in the late Neolithic, followed by three mortuary phases covering the Bronze Age. This report describes the excavation, chronology, the material culture, human remains and social structure of the prehistoric inhabitants. It is the first volume in a series reporting on the research programme "The Origins of the Civilization of Angkor".

Of particular note to bioarchaeologists will be Chapter V: The People of Ban Lum Khao by Kate Domett (pp 113-158). This chapter details the health of the skeletal remains from the site. Aspects such as age at death, stature and other metric data, enamel hypoplasia, osteoarthritis, trauma and dental health are discussed.

Erratum: The following burials have incorrect age at death or sex estimates in Appendix 1: The Census (p 152). The following are the correct age at death estimates:

Burial 4: 2 years, Burial 10: 18 years, Burial 22: ?male, Burial 52: 25-29 years, and Burial 95: female.

- SOUTHEAST ASIAN BIBLIOGRAPHIC DATABASE  
<http://seasia.museum.upenn.edu/>

- Useful Journals to check regularly:
  - American Journal of Physical Anthropology  
<http://www3.interscience.wiley.com/cgi-bin/jhome/28130>
  - Antiquity  
<http://antiquity.ac.uk/>

- Asian Perspectives  
[http://muse.jhu.edu/journals/asian\\_perspectives/](http://muse.jhu.edu/journals/asian_perspectives/)
- Current Anthropology  
<http://www.journals.uchicago.edu/CA/home.html>
- International Journal of Osteoarchaeology  
<http://www3.interscience.wiley.com/cgi-bin/jhome/5488>
- Journal of Anthropological Science  
<http://www.sciencedirect.com/science/journal/02784165>
- Journal of Archaeological Research  
<http://www.springerlink.com/app/home/journal.asp?wasp=afc299293ee44e70b946e34eb29f3165&referrer=parent&backto=linkingpublicationresults,1:104889,1>
- World Archaeology  
<http://www.jstor.org/journals/00438243.html>
- Siksacakr, Centre for Khmer Studies  
<http://www.khmerstudies.org/publications/siksacakr/siksacakr.htm>

### ***Conference Details***

- PROCEEDINGS OF THE AUSTRALASIAN SOCIETY FOR HUMAN BIOLOGY HUMAN CONTACTS IN THE PAST: ORIGINS, ADAPTATIONS, AND HEALTH IMPLICATIONS

Abstracts from the 2004 conference have recently been published in *Homo – Journal of Comparative Human Biology* 56 (3): 219-302. Of particular relevance to Southeast Asian Bioarchaeology may be abstracts by the following primary authors: M. Oxenham & Whitworth (Mandibular condylar depressions – see above for full paper) and Tayles & Domett (Dangers of Southeast Asian Neolithic Life).

Also look out for the 2005 ASHB conference abstracts to be published in *Homo* in 2006 where papers presented by Domett & Buckley (Cranial trauma in pre-Angkorian Cambodia) and Oxenham & Matsumara (Palaeohealth in Hokkiado, Japan) provided relevant new information for Southeast Asian bioarchaeologists.

- INDO-PACIFIC PREHISTORY ASSOCIATION

Manila, Philippines March 2006. Have a look at the following website that lists the sessions undertaken if you missed this conference:

<http://arts.anu.edu.au/arcworld/ippa/Manila%20Program.htm>

The following is the website for the IPPA abstracts:

<http://arts.anu.edu.au/arcworld/ippa/Manila%20abstracts%20final.htm>

Of particular note will be abstracts from the following session:

#### **Session 5G: BIOARCHAEOLOGY IN SOUTHEAST ASIA**

“This session will review new developments in the study of human remains in prehistoric Southeast Asia with emphasis on: human origins, dispersals and relationships; quality of life (health, disease and palaeodemography); and bioarchaeological research and development in general. Following a comparable meeting held in Siem Reap in 2004, this session at the 18th IPPA Congress provides the opportunity to share current bioarchaeological research, news and views with the academic community at large.”

Marc F. Oxenham et al: *The Phung Nguyen Period cemetery Man Bac: preliminary bioarchaeological findings.*

Hirofumi Matsumura et al: *An early Holocene human skeleton from Hang Cho, northern Vietnam: its implication for a "Two Layers" hypothesis on the origin of Southeast Asians.*

Nguyen Lan Cuong: *A report on the skeletal remains of the Dongson culture excavated from the site of Dong Xa, northern Vietnam.*

Laura Shackelford: *Postcranial anatomy and robusticity in Tam Hang, Laos*

Korakot Boonlop: *Life, health, death, and paleodemography of the late prehistoric inhabitants of Ban Khok Khon, Northeast Thailand*

Natthamon Pureepatpong and Tanongsak Lerdpipatworakul: *An analysis of human remains from archaeological sites in Pang Mapha district, Mae Hong Son, Northwestern Thailand*

Yousuke Kaifu et al: *The Meganthropus problem reconsidered*

Johan Arif: *Dental wear of Paleolithic, Mesolithic, and Neolithic communities from Indonesia*

Jack G. L. Medrana: *Skeletal features and palaeopathology of the burial population in the Guyangan caves, Romblon province, Philippines*

Michelle S. Eusebio Dizon-I: *Analysis of archaeological lipids from pottery excavated in, Babo Balukbuk, Porac, Pampanga, Philippines*

Michael James Bannister Herrera: *Recovery of ancient mitochondrial DNA sequences: a perspective on the feasibility of a DNA research for Philippine archaeology*

Chin-hsin Liu and John Krigbaum: *Childhood stress in an Iron Age population from Taiwan*

Hallie Buckley and Nancy Tayles: *Musculoskeletal stress markers in the Lapita skeletons of Teouma, Vanuatu: What can the remains of the Teouma people say about their subsistence economy?*

Melanie Pierson: *Tracking maternal lineages - mtDNA haplogroups in the Pacific*

Rene J. Herrera: *On the genetic characteristics of Austronesian populations*

Lee, Alex Yi-Chuang: *Ancient diet and environmental adaptation of Southeast Asian prehistoric populations - implications revealed from buccal dental microwear data*

Y. M. Lam: *The effect of taphonomic processes on the interpretation of archaeological faunal and human remains*

There were also relevant papers in other sessions such as:

Session 4B: Current Archaeological Research in Laos

Session 4C: Recent Advances in Taiwan Archaeology

Session 4F: Research in Progress in Indonesian and East Malaysian Prehistory

Session 4G: Current Archaeological Research in Vietnam

Session 4J: New Insights into the Cambodian Past: Prehistory to the Decline of Angkor

Session 4K: Mortuary Variability in Prehistoric Thailand

- Paleopathology Association

<http://www.paleopathology.org/>

The 16th European Meeting of the Paleopathology Association, will be held from August 28th to September 1st 2006 in Santorini, Greece.

- American Association of Physical Anthropologist

<http://physanth.org/>

The 76<sup>th</sup> Annual meeting will be held in Philadelphia, PA, March 27-April 3, 2007.

- European Association of Southeast Asia Archaeology (email: [eurasea2006@club-internet.fr](mailto:eurasea2006@club-internet.fr))

2006 Meeting: Bougon, France 25-30<sup>th</sup> September.