

Southeast Asia Bioarchaeology Newsletter

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Edited by Kate Domett
Kate.Domett@jcu.edu.au

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

News

SKELETAL BIOLOGY, POPULATION DYNAMICS, AND THE BIOMORTUARY APPROACH AT MAN BAC: A LATE NEOLITHIC VILLAGE IN NORTHERN VIETNAM.

From: Damien Huffer, Marc Oxenham, Kate Domett
Australian National University
Email: damien.huffer@anu.edu.au

Man Bac, near the village of Bac Lien, in Yen Thanh Commune, Ninh Binh Province, northern Vietnam, was officially established as a site in 1998. Excavation work during four seasons (1999, 2001, 2004/05, and 2007) has been carried out by a joint Vietnamese, Japanese, and (during the 2004/05 and 2007 seasons) Australian team, led by Drs. Nguyen Kim Dung, Nguyen Lan Cuong, Hirofumi Matsumura, and Marc Oxenham. By the end of the 2007 season, a total of 95 individuals had been recovered, almost all in an excellent state of preservation. New C14 dates taken from charcoal adhering to mortuary vessels now date the burial strata to c. 3,800-3,600 BP, and material cultural continuities between grave goods and midden-deposited objects suggests that the mortuary and inhabitation components were roughly contemporary.

Analyses of the skeletal material are still continuing but preliminary compilations of a demographic profile for Man Bac have revealed a relatively young population, with many individuals dying in childhood (67% \leq 15 years of age) (Oxenham et al, in press). This is somewhat atypical when compared to other skeletal sequences from Southeast Asia, and directly suggests both high fertility and high mortality. Encountering new diseases in a newly settled land, and the overall hardships of late Neolithic farming life would have both taken their toll. Further evidence for this can be seen in the relatively high rates of childhood caries (for those subadults examined so far) (Oxenham et al, in press), moderate to severe vertebral osteoarthritis and DJD afflicting most of the adult population, and an individual who suffered trauma (30yr old adult male-healed midshaft radial fracture), and Vietnam's, and very likely Southeast Asia's, first prehistoric example of lower limb paraparesis/paralysis (approx. 30-35yr old female). (Oxenham et al, 2007, ASHB abstract).

A key aspect of social differentiation in death was interment of males, females, and children within distinct, spatially separated clusters. Preliminary mortuary analysis has suggested these clusters represent family or household units, likely founded by a high-status patriarch or matriarch. Very importantly, it is apparent that at least one of these high-status individuals (a 40-45yr old male), and,

from the 2007 season potentially two others, is genetically and morphometrically “Austroasiatic”, thus representing some evidence of local adoption into an intrusive, early agricultural community (Matsumura et al, in press). In light of this, it is hoped that cranial nonmetric, and strontium and oxygen isotopic analysis will better illuminate individual and/or family migration patterns, perhaps revealing physical bases for socio-cultural/mortuary patterns, where aDNA analysis has so far proved inconclusive.

Overall, the ongoing bioarchaeological analyses will continue to make Man Bac a fundamental baseline for future work at other Vietnamese Neolithic sites, and via relevant comparisons to Thai populations, allow for a more regionally complete and nuanced comprehension of the entire Southeast Asian Neolithic.

Plans for a monograph on all archaeological aspects of the site are underway including such possible chapters as follows:

Man Bac: A Census

Senior Author: Kate Domett
Co-Authors: Marc Oxenham Nguyen Lan Cuong, Nguyen Kim Thuy, Hirofumi Matsumura MF
Oxenham, Wataru Takigawa

Palaeohealth at Man Bac

Senior Author: MF Oxenham
Co-Authors: Kate Domett

Quantitative and Qualitative Cranio-morphology at Man Bac

Senior Author: Hirofumi Matsumura
Co-Authors: Nguyen Lan Cuong, Nguyen Kim Thuy, Yukio Dodo

Quantitative and Qualitative Dental-morphology at Man Bac

Senior Author: Hirofumi Matsumura
Co-Authors: Nguyen Lan Cuong, Nguyen Kim Thuy

Mitochondrial DNA of Human Remains at Man Bac

Senior Author: Ken-ichi Shinoda
Co-Authors: Nguyen Kim Thuy

Man Bac: Dietary Insights from Stable Isotopes

Senior Author: Minoru Yoneda



Figure 4: Excavating at Man Bac in 2005 – who knew it could be so cold working in Southeast Asia!
(Photo: Kate Domett)



Figure 5: Nguyen Lan Cuong working on one of the many subadult burials at Man Bac (2005).
(Photo: Kate Domett)

REPORT FROM THE SIXTH AND SEVENTH EXCAVATION SEASONS, BAN NON WAT,
THAILAND.

From: Drs Siân Halcrow and Nancy Tayles

Department of Anatomy and Structural Biology, University of Otago, New Zealand

Email: sian.halcrow@anatomy.otago.ac.nz, nancy.tayles@anatomy.otago.ac.nz

The final (sixth and seventh) excavations for the Origins of Angkor archaeological project at Ban Non Wat, Amphur Non Sung, Nakhon Rachasima, Northeast Thailand took place during 2006 and 2007. These excavations were directed by Professor Charles Higham of the University of Otago, New Zealand, Drs Rachanie Thosarat (Bangkok) and Amphan Kijngam (Fine Arts Department of Thailand).

The sixth season extended from December 2006 to March 2007. Bioarchaeologist Nancy Tayles, and students Helen Cekalovic, Anna Willis, Kimberly Curtis and Di Leech participated in the excavation, lifting and curation of the human skeletal remains. Chris Smith assisted with photography of the burials. During the season, the excavation yielded 101 burials, bringing the total from the site to 573.

The seventh season extended from October to early December 2007. Drs Nancy Tayles and Siân Halcrow were present for part of the excavation, but the majority of the excavation and lifting of the human burials was undertaken by Dr Rachanie Thosarat and her excavation team. This season yielded another 63 burials bringing the total from the site to 636.

Following previous season's findings, the sixth and seventh excavations show variability in palaeodemographic results. In the sixth, 48/102 (47.1 percent) of the sample are subadult (younger than 15 years of age), while the seventh season only 10/63 (15.8 percent) were subadult. These results demonstrate that different mortality data may be produced dependent on which areas of the site are excavated (Tayles and Halcrow, 2007). There is also not only spatial variability in age composition in the sample, but variation in the use of the cemetery over time (Higham, 2004). For example, the Iron Age burials are clustered within the southeast part of the excavation area. This illustrates the advantage of excavating a large area to get a representative picture of the cemetery sample. This also gives us the opportunity to assess spatial and temporal aspects of mortuary patterns and health data.

The Ban Non Wat human skeletal remains represent the largest archaeological sample from Southeast Asia. The long chronology of this site, spanning from 4000 to 1500 BP offers an exciting opportunity to study aspects of human biology over this important period of agricultural intensification, technological development and social change. The research questions that we are interested in addressing include:

What was the quality of life of the individuals?

Is there evidence of health change over time?

How does this evidence fit with the archaeological data on environmental change?

How does this evidence fit with biological data from other prehistoric Southeast Asian sites?

Is there evidence of migration of people into the area?

How does our information on migration contribute to understanding health and marital residence patterns of the people represented in this sample?

Laboratory analysis of the human skeletal sample has been carried out during several visits since 2005 and is ongoing. The bioarchaeological team have specific research question to address:

- Dr Nancy Tayles is the director of research on the human remains and is assessing population health and adaptation, through analysis of palaeodemography, and dental and skeletal health.
- Dr Alex Bentley (University of Durham, UK) and Katharine Cox (PhD student, University of Otago, New Zealand) are investigating migration through stable isotopic analysis. Katharine is also investigating this topic using non-metric traits of the dentition.
- Dr Kate Domett's (James Cook University, Australia) research focuses on osteoarthritis.
- Dr Siân Halcrow is analysing multiple indicators of health and disease in the subadult component of the sample, and has recently completed the laboratory data collection.
- Helen Cekalovic (James Cook University, Australia) is researching adult health from the late Bronze Age to the Iron Age for her PhD using a health index system she has developed for Southeast Asia.
- Anna Willis has completed a Master of Science degree with Dr Nancy Tayles at the University of Otago on mortuary practices, particularly burial position, at prehistoric Thai sites, including Ban Non Wat (her abstract is included in the 2006 newsletter).
- Kimberly Curtis has completed a Master of Science degree with Dr Nancy Tayles at the University of Otago on evidence of childhood health from the adult skeletons (her abstract is included in this newsletter).
- Nattamon Pureepatpong has also been involved in the laboratory work and plans to undertake a PhD on the human skeletal remains from this site.
- Aimee Foster has recently started her PhD with Drs Hallie Buckley and Nancy Tayles at the University of Otago. She will be studying markers of occupational stress in prehistoric Pacific and Southeast Asian samples. The Southeast Asian samples include Ban Non Wat, Man Bac (Northern Vietnam) and Hoa Diem (South Central Coast of Vietnam).
- In addition, Dr Rachanie Thosarat and Thai archaeologist Chanakarn Hongtong, together with a team of assistants have contributed their valued archaeological expertise during excavation and laboratory work.

As noted in previous newsletters, we are interested in working with more Thai bioarchaeologists and welcome enquiries from any prospective students interested in developing these skills.

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BIOARCHAEOLOGICAL REPORT FROM THE 2007 EXCAVATION SEASON, PROMTIN TAI, CENTRAL THAILAND

From: Drs Siân Halcrow and Nancy Tayles

Department of Anatomy and Structural Biology, University of Otago, New Zealand

Email: sian.halcrow@anatomy.otago.ac.nz, nancy.tayles@anatomy.otago.ac.nz

The site of Promptin Tai located in Kok Samrong District, Lopburi Province, Central Thailand has been of archaeological interest since the early 1990s, with the restoration of an Ayutthaya period brick structure and excavation of test units at the site. Further excavation in 2004 by Silpakorn University uncovered an occupation sequence from the late Bronze Age through to the Dvaravati period including Iron Age burials (Lertcharnit, 2006). In mid 2007 under the direction of Thanik Lertcharnit (formerly Sawang Lertrit) from Silpakorn University an excavation opening a 6x6 metre square was undertaken at the site. The articulated human burials were left *in situ* once exposed during the excavation, which had resulted in some cracking and fragmentation of the bone. Nancy and Siân visited the site from the 6th-12th of October 2007 and archaeologists Thanik Lertcharnit, Arunee Sae-lout and Nichanan Klangwichai provided very helpful assistance for part of this time. The objective of this fieldwork was to lift some of the burials to prevent further damage. In doing so, this also enabled further excavation in the square in late 2007. This report summarises the preliminary bioarchaeological fieldwork undertaken.

Of the 32 burials excavated in the 2007 excavation, 27 remained in the ground when we arrived. On consultation with Thanik Lertcharnit, we agreed on a priority list of skeletons to be lifted, based primarily on their completeness. Eleven burials were recorded, lifted and curated during this field visit and are housed in the museum at the Promptin Tai wat. Most of the other burials were not fully excavated, as they are buried within the soil “pedestals” of the exposed burials. Of the burials not lifted, preliminary recordings were made. During a future visit we plan to lift the remaining burials. The sample will be cleaned and reconstructed, age and sex estimates will be carried out, and a full recording of metric data completed, together with any observations of dental and skeletal pathology.

Preliminary palaeodemographic observations were made. In the lifted and unlifted sample 18.8 percent were subadult with none aged less than one year of age. This is probably indicative of sampling bias, as is the absence of older adults. For the adults the sex ratio is balanced, albeit a small sample.

This is one of the few Iron Age burial sites excavated in Southeast Asia. The good preservation of bone in most of the individuals compared with previously studied sites (for example, Tayles *et al.*, 2007) attests to the great potential for this sample to contribute to knowledge on human adaptation during this time in Southeast Asian prehistory.

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- Tayles, N., Halcrow, S. E., Domett, K., 2007. The people of Noen U-Loke. In: C. F. W. Higham, A. Kijngam, S. Talbot (Eds.), *The Origins of the Civilization of Angkor, Volume 2: The Excavation of Noen U-Loke and Non Muang Kao*. The Thai Fine Arts Department, Bangkok, pp. 243-304.

NEW PHD STUDENT WORKING ON ISOTOPES FROM BAN NON WAT, THAILAND

From: Dr Alex Bentley
School of Anthropology, Durham University, England
Email: r.a.bentley@durham.ac.uk

We are pleased to welcome Miss Chelsea Budd, a new Ph.D student at Durham University, into the community of Southeast Asian bioarchaeology. Funded by a U.K.-based (AHRC) grant under Alex Bentley, in collaboration with Nancy Tayles and Charles Higham of the University of Otago, Miss Budd is embarking on a project to measure strontium and oxygen isotopes in tooth enamel samples from hundreds of human skeletons from Ban Non Wat. These isotopes, which differ from place to place, indicate the geographic area from which each person obtained his/her diet during childhood (when the enamel was forming). By making comparison with the extensive radiocarbon record from Ban Non Wat just completed by Charles and Tom Higham, Miss Budd can also investigate how immigration patterns and diet changed through time, and how these changes may have differed among women and men, and the associated burial positions and/or artefacts. It is hoped that these multiple lines of evidence will provide a new perspective on changes in social differentiation, migration between communities, and marriage exchange through time: all poorly understood social aspects of early state origins.

After completing her BSc in Geography and Archaeology at Hull University, Miss Budd recently completed the MSc in Archaeological Science at Oxford University, where she processed 80 samples for carbon and nitrogen isotope analysis, 23 samples for AMS radiocarbon dating using the ultrafiltration technique and 8 samples for compound-specific isotope analysis through hydrolysis of the skeletal collagen. The forthcoming publications from her thesis examine the carbon and nitrogen isotopic compositions of human and faunal skeletal assemblages (both bones and teeth) from the Ukraine, integrated with radiocarbon dating to track the chronology of dietary shifts during this period.

NEW EXCAVATIONS AT BAN NON WAT, THAILAND

From: Drs Kate Domett and Nigel Chang
James Cook University, Australia
Email: kate.domett@jcu.edu.au, nigel.chang@jcu.edu.au

After seven incredibly productive seasons of excavation at Ban Non Wat, northeast Thailand, under the direction Higham, Thosarat, Tayles & Kijngam the decision was made to continue with a new phase of excavation and associated research at the site with a new team. The new project was begun at the village in December 2007. Team leaders are Drs Nigel Chang and Kate Domett from James Cook University, Professor Bill Boyd from Southern Cross University, Amphan Kijngam from the Royal Thai Fine Arts Department and Warrachai Wirriaromp from Kasetsart University, Bangkok. The project is entitled "Resilience and Opportunity in Ancient Southeast Asia" where the focus is to build on the detailed excavations already completed in order to develop a broader picture of life at the site and its place in the regional social and environmental contexts. Investigating the utility of a 'Resilience' theory approach to understanding change will also be important.

During recent fieldwork four 4x4m squares were excavated across the mound from near the centre to the edge of the mound with burials so far encountered dating to the Iron Age through to the Bronze Age. Neolithic levels have also been uncovered and will be further investigated during the next field season starting in December 2008. Members of the “bone team” included Helen Cekalovic, a PhD student at JCU, Jaime McHugh, an Honours student at JCU, Dr Lynley Wallis from Flinders University, Angela Clark from the University of Bradford in the UK and Dr Nancy Tayles from the University of Otago. In the first season a total of 33 burials were excavated with subadults (12, 36%) and male and female adults (21, 64%) identified. Preservation varied considerably throughout the different squares, with very few burials complete and in good condition. Most had some degree of fragmentation or disturbance from pits and/or the postholes from later occupation. Dr Siân Halcrow has completed an assessment of subadults and the adults will be cleaned and analysed later this year. The next excavation season begins in December 2008.



Figure 1: Lynley, Angela and Jaime busily cleaning bones from Ban Non Wat.
(Photo: Kate Domett)

A GENERAL SUMMARY OF RECENT PROJECTS INVOLVING HUMAN SKELETAL REMAINS IN CAMBODIA

From: Dr Kyle Latinis
Faculty of Social Sciences and International Relations
Pannasastra University, Cambodia
Email: ruijingzhu@yahoo.com

The following discussion concerns recent burial discoveries and archaeological work in Cambodia. The discussion is based on preliminary observations and discussions. Detailed reports will eventually be produced by the various researchers and their colleagues involved in the discoveries. Any misinterpreted information is solely this author’s responsibility. The following report is meant to be brief but informative in order to attract further attention to the rapidly disintegrating potential for burial and skeletal research in Cambodia; a problem exponentially exacerbated by the growth in looting and development.

As an important note, all projects collaborate with the Ministry of Culture and Fine Arts in Cambodia and most projects collaborate with the Royal University of Fine Arts and APSARA authority professionals. There have been numerous local and external supporting institutions which often remain unnamed in this paper. However, details of publications, internet/web sites and donor funding organizations are available upon request from the author and the people and organizations referred to in this report. Information about GPS coordinates, historic information and additional visual images of sites and skeletal remains are also available upon request.

Recent Projects

1. Recently, a Japanese and Cambodian team have conducted additional excavations at **Phum Snay** in northwest Cambodia with some dubious speculations of Chinese connections. Reports and newspaper articles are available online. Nonetheless, it is clear that more detailed analysis will need to be conducted to further verify these claims, if true. The current author remains skeptical that these claims are valid.

2. Continuing with northwest Cambodia, the recently surveyed and excavated **Thmar Puok** (aka **KVC-Koh Vat Chas**) site and neighboring sites (**Pheourn Banana Farm, aka PBF**) and numerous slightly mounded sites extending through various proximate provinces in Cambodia and Thailand, have produced numerous metal age (primarily iron age) burials with bronze, iron, gold, glass, pottery, faunal, and other artifacts. It should be noted that the Thmar Puok site is located near the Banteay Torp and famed Banteay Chhmar Angkorian temple sites. Thmar Puok village itself harbors a small temple site in which only most of the base and foundation as well as the moats/pond remain.



Figure 2: Dr. Dougald O'Reilly at the Thmar Puok Site (note the numerous looters pits, many of which have human skeletal remains discarded around the edges). (Photo: Kyle Latinis)

The Thmar Puok excavations were conducted under the direction of Dr. Dougald O'Reilly and Dr. Kyle Latinis with field support and training from international archaeologists; Shah Alam (Singapore), Andrew Cowan (Canada), Dr. Marc Oxenham (Australia) and other senior students. Chris Walwork and Kathy Liu have detailed reports concerning the finds, analysis and analyses of other ossuary material described below. Graduate students and professionals from Australia and Cambodia. Heng Sophady, Serevath, Sokvath, Sampours, and Vic, among others, (at the time working with Heritage Watch) have other interesting speculations. (*Editor's note: Dr Oxenham made a brief report on the skeletal remains in the 2006 newsletter*).

Heritage Watch NGO initiated this project with support from the Ministry of Culture and Fine Arts, the Royal University of Cambodia and the US Embassy. Special thanks is given to Dean and Prof. Pheng Sytha for his support from the Royal University of Fine Arts Archaeology Program. It was an interesting project which combined training in archaeology, osteology, survey, CRM (cultural resource management), ethnoarchaeology and ethnography. A preliminary report is available by Dr. D. Kyle Latinis, the Ministry of Culture and Fine Arts and Heritage Watch.

Burial artifacts include pottery, beads, iron tools, bronze ornaments, spindle whorls and the usual suspects of artifacts from the iron age period. Only a few burials were exhumed while the rest were reburied for future excavation due to limited time. The PBF site seemed less ostentatious in burial goods which could reflect economic and cultural differences (i.e., it could be hypothesized that they were economically and culturally more marginal than other sites).

The use of ethnographic and CRM surveys discovered water control systems at KVC (credit to Heng Piphal) and land modifications. The dates are unknown as pottery from excavations indicate occupation from the metal ages to the post-Angkor periods (not unexpected considering this is becoming a relatively consistent pattern of occupation in Cambodia; albeit settlement size, density and nature during the historical trajectory is relatively under researched in long occupation period sites/areas). Presumably the burials date to the Iron Age.

Burial sites are generally found on slightly higher mounded areas (approximately 200-400 meters in diameter dimensions—generally oval shaped and only a few meters above the lower rice field plains). Unfortunately, looters and farmers at scores of other sites, which are heavily looted, in the region generally throw the skeletal remains away near the pits or farmed areas. This is verified from surveys at numerous sites in the area and informant testimony (see Figure 2).

3. Additional surveys of ossuaries at villages such as **Koh Krabas**, have noted that residents occasionally store burial remains in small houses (see Figure 3). Almost all remains are recovered from farming and looting. They do not travel far from their discovery locations.

Chan Sovichetra conducted a survey in the region within an approximately 30km radius and discovered scores of similar sites, heavy looting, but only a few additional ossuaries

However, there is potential. Dr. Marc Oxenham and his colleagues as well as Kathy Liu (University of Florida) were able to analyze ossuary and in situ collections. The collections, almost without question, belong to proximate



Figure 3: Dr. Marc Oxenham at one of the NW Cambodian Ossuaries (of prehistoric remains) (Koh Krabas). (Photo: Kyle Latinis)

sites and date to the metal ages (confirmed by artifact types and styles collected from looted/excavated burials by local residents and farmers during the CRM and ethnographic phases of the project).

Of interest, beyond the stature, age and other normative osteological information provided in their reports, is the high incidence of pre-mortem upper lateral incisor ablation. There also seemed to be a low incidence of chronic disease or other skeletal disorder due to malnutrition, etc. as well as a low incidence of heavy skeletal trauma. Nonetheless, these are only preliminary observations. Dr. Oxenham and his crew provide more accurate details in their reports.

4. Lastly, for this report, a very recent discovery of skeletal remains in a Dongson drum (Heger style) have been recovered in **Prey Veng Province** about 15-20km north of the famed Ba Phnom site. A complete skull remains inside the drum. Burial artifacts included gold, iron, bronze, glass, pottery and other artifacts within and proximate to the drum. The burial is somewhat reminiscent of drum burials in Indonesia (see Bintarti). These are currently under investigation under Heng Sophady at the Ministry of Culture and Fine Arts newly formed archaeology and conservation lab. It is likely that the burial dates to the Dongson period approximately dating as far back as two millennia or more.

Additionally, EDXRF and other archaeometric analyses for artifacts and skeletal remains (Dr. Nancy Beaven at the Raftor Radiocarbon Labs has pioneered the latter) have been conducted on samples from many of the sites. Reports are available upon request but clearly indicate unique exchange/communication connections beginning from the Neolithic (both local networks and large scale foreign networks).

In conclusion, there is much to be done. However, projects need to be done soon as the sites and skeletal (as well as artifactual) remains are quickly disappearing and becoming less well provenienced. These are non-renewable resources. The Ministry of Culture and Fine Arts as well as all relevant local and foreign institutions are eager to support additional research.

I would like to thank all people and institutions for involving me in one way or another on these projects and more (many of which remain unstated here). I apologize if there are names, institutions and references omitted due to space requirements, but all are well thanked for their efforts. Special thanks is given to the Ministry of Culture and Fine Arts, the Royal University of Cambodia, the Royal Academy of Cambodia, and Heritage Watch as well as the Government of Cambodia for their permission, support and continued interest.

ANTHROPOLOGICAL STUDY OF THE PRE-ANGKORIAN POPULATION FROM KOH TA MEAS SITE (WESTERN BARAY, ANGKOR, SIEM REAP, CAMBODIA)

From: Dr Mélanie Frelat

National Museum of Natural History, Prehistory Department, USM 103, CNRS UMR 5198, France

Email: mfrelat@mnhn.fr

From May 2007 to August 2007, Dr Mélanie Frelat (MNHN, Paris, France) was housed at the Siem Reap EFEO centre for a post doctoral mission granted by the EFEO. The aim of the study was the complete inventory of the human remains found during the excavation of the Koh Ta Meas necropolis (Bronze age) conducted in 2005 by Christophe Pottier (EFEO). Nearly 30 partial skeletons were studied, i.e. age and sex estimation, health status and morphometric data. All the remains have been documented and appropriately packed and stored in the Siem Reap EFEO center, waiting there for further analyses.

NEWS FROM SOUTH ASIA

From: Professor John R. Lukacs

Department of Anthropology, University of Oregon

Email: jrlukacs@uoregon.edu

At the University of Oregon research in bioarchaeology and related topics continues and several projects and notable achievements have recently been completed or are in progress.

Last year (2007) Gwen Robbins successfully defended her doctoral dissertation, entitled "Population dynamics, growth and development in Chalcolithic sites of the Deccan Plateau, India" and following her initial appointment as visiting assistant professor of anthropology at Appalachia State University

(2006-07), she was appointed to a tenure-track position in biological anthropology beginning in Fall 2007.

In June (2-3 June 2007), I attended a workshop on “Ganges Basin in Prehistory & Bioarchaeology” at Cambridge University. Hosted by the Department of Biological Anthropology, Leverhulme Center for Human Evolutionary Studies, & Ancient India & Iran Trust and organized by Michael D. Petraglia, Nicole Boivin (Cambridge / Macdonald Institute) Dorian Fuller (University College London), the purpose of this workshop was to plan further interdisciplinary bioarchaeological research on early Holocene foragers of the mid-Ganga basin. I presented a presentation: “Bioarchaeology of Holocene Foragers of the Ganga Plain”.



Figure 5: Professor John Lukacs carrying out dental metric analyses.

During the summer of 2007 substantial progress was made on a monograph dedicated to the biological adaptation of early Holocene Foragers of North India, essentially a Bioarchaeology of Mesolithic human remains from the site of Damdama which preserves 47 partial and complete skeletons. This project, in collaboration with J.N Pal, should be complete by the end of summer 2008 and will be published in England by British Archaeological reports and in India by the University of Allahabad, Department of Ancient History, Culture and Archaeology.

In the Fall of 2007 a research term, with support from the Wenner-Gren Foundation and in collaboration with Dr. Sri Kuswandari, DDS (Gadjah Mada University, School of Dentistry, Department of Pediatric Dentistry; Yogyakarta, Indonesia), I analyzed the crown morphology and metrical attributes of a sample of Malay primary teeth (n=150). Since returning to Oregon in late December work has progressed on two aspects of this research, one clinical report destined for a journal of pediatric dentistry, addresses the topic “Talon cusp in Malay primary teeth: Expression, frequency, covariates and treatment needs” and another manuscript now in preparation is devoted to variation in crown morphology of Malay deciduous teeth, includes a multi-variate global comparison, and will be submitted this spring to a journal of anthropological research.

Recent Publications

BOOKS

- ANCIENT HEALTH: SKELETAL INDICATORS OF AGRICULTURAL AND ECONOMIC INTENSIFICATION

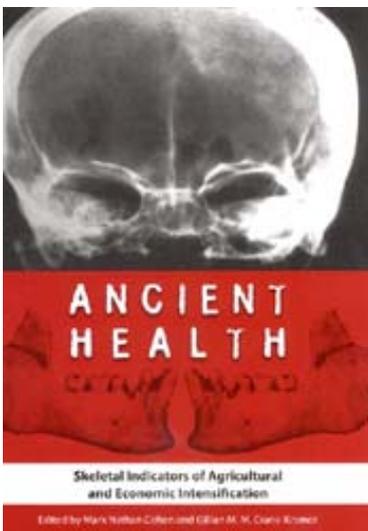
Marc Nathan Cohen and Gillian Crane-Kramer (editors)

2007

University Press Florida

ISBN: 978-0-8130-3082-1

<http://www.upf.com/book.asp?id=COHENF06>



Twenty years ago Mark Nathan Cohen coedited a collection of essays that set a new standard in using paleopathology to identify trends in health associated with changes in prehistoric technology, economy, demography, and political centralization. *Ancient Health* expands and celebrates that work.

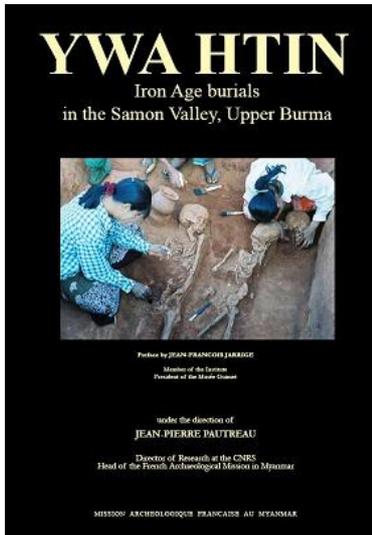
Confirming earlier conclusions that human health declined after the adoption of farming and the rise of civilization, this book greatly enlarges the geographical range of paleopathological studies by including new work from both established and up-and-coming scholars. Moving beyond the western hemisphere and western Eurasia, this collection involves studies from Chile, Peru, Mexico, the United States, Denmark, Britain, Portugal, South Africa, Israel, India, Vietnam, Thailand, China, and Mongolia.

Adding great significance to this volume, the author discusses and successfully rebuts the arguments of the "osteological paradox" that long have challenged work in the area of quantitative paleopathology, demonstrating that the "paradox" has far less meaning than its proponents argue

CHAPTERS OF RELEVANCE TO SOUTHEAST ASIA:

16. Climate, Subsistence, and Health in Prehistoric India: The Biological Impact of a Short-Term Subsistence Shift. *John R Lukacs.*
18. Diet and Health in the Neolithic of the Wei and Middle Yellow River Basins, Northern China. *Ekaterina A. Pechenkina, Robert A. Benfer Jr., and Xiaolin Ma.*
19. Prehistoric Dietary Transitions in Tropical Southeast Asia: Stable Isotope and Dental Caries Evidence from Two Sites in Malaysia. *John Krigbaum.*
20. Population Health from the Bronze to the Iron Age in the Mun River Valley, Northeastern Thailand. *Kate Domett and Nancy Tayles.*
21. Biological Consequences of Sedentism: Agricultural Intensification in Northeastern Thailand. *Michele Toomay Douglas and Micheal Pietrusewsky.*

- YWA HTIN: IRON AGE BURIALS IN THE SAMON VALLEY, UPPER BURMA



Jean-Pierre Pautreau (editor).
2007
ISBN 978-974-7525-35-9
English/French. 298 p., 575 illustrations, many in colour.

This book details the excavation of the cemetery Iron Age site of Ywa Htin (Myanmar). It has a chapter on anthropological field observations (conservation, burial method, burial position, etc) by Patricia Mornais. A further chapter details the subadult burials by Anne-Sophie Coupey and a brief description of the dentition by J. Peuziat.

If you wish to order this book (30 Euros), please email:
jean-pierre@pautreau.fr with a copy to coupeyas@yahoo.fr

- THE ORIGINS OF THE CIVILIZATION OF ANGKOR: VOLUME TWO: THE EXCAVATION OF NOEN U-LOKE AND NON MUANG KAO.

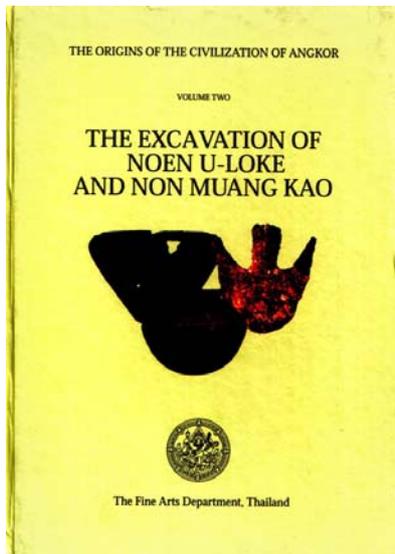
CFW Higham, R Thosarat and S.Talbot (editors)

2007.

Bangkok: Thai Fine Arts Department.

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

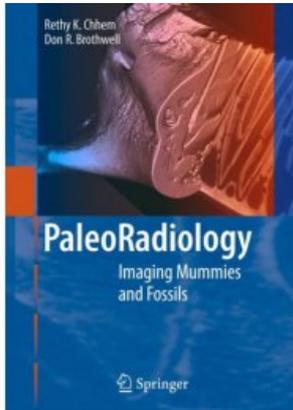
ISBN 9744176881.



Noen U-Loke and Non Muang Kao are two large, moated prehistoric settlements in Nakhon Ratchasima Province, Northeast Thailand. Excavations in 1997-8 revealed a cultural sequence that began in the late Bronze Age, followed by four mortuary phases covering the Iron Age. This report describes the palaeoenvironment, excavation, chronology and material culture, human remains and social structure of the prehistoric inhabitants of these two sites. It is the second volume reporting on the research programme “The Origins of the Civilization of Angkor”.

Of particular note to bioarchaeologists will be Chapter XVII: The People of Noen U-Loke by Nancy Tayles, Sian Halcrow and Kate Domett (pp 244-304). This chapter details the health of the skeletal remains from the site. Aspects such as demography, growth, stature, enamel hypoplasia, disease (including a summary of three cases for systemic infectious disease), dental health including evidence for tooth ablation are discussed.

- PALEORADIOLOGY: IMAGING MUMMIES AND FOSSILS



Rethy Chhem and Don Brothwell (editors).
2008

Springer

ISBN: 978-3-540-48832-3

Paleoradiology is the use of X-rays and advanced medical imaging modalities in the evaluation of ancient human and animal skeletons as well as biological materials from archaeological sites.

Paleoradiological studies have been performed on mummies, skeletal remains and fossils to determine their sex and age at death. Diagnostic paleoradiology is the use of X-ray studies to detect ancient diseases. This book includes reference to work Professor Chhem has completed on skeletal remains from Cambodia particularly from the Angkor region and the Cardamom mountains.

<http://www.springer.com/medicine/radiology/book/978-3-540-48832-3>

JOURNAL ARTICLES

Important Note: Professor Mike Pietrusewsky from the University of Hawaii has been appointed Associate Editor for the *American Journal of Physical Anthropology* (2008- 2012).

In press:

- Stress near the start of life? Localised enamel hypoplasia of the primary canine in late prehistoric mainland Southeast Asia.

Halcrow, S. E. and Tayles, N. (in press) (published online 2008)

Journal of Archaeological Science

[doi:10.1016/j.jas.2008.02.002](https://doi.org/10.1016/j.jas.2008.02.002)

- Health and the experience of childhood in late Neolithic Vietnam.

Oxenham M.F., Matsumura H, Domett K, Nguyen Kim Thuy, Nguyen Kim Dung, Nguyen Lan Cuong, Huffer D, Muller S. (in press)

Asian Perspectives

- Health in Pre-Angkorian Cambodia: a bioarchaeological analysis of the skeletal remains from Phum Snay.

Domett K.M., and O'Reilly D.J.W. (in press)

Asian Perspectives.

- Morphometric affinity of the late Neolithic human remains from Man Bac, Ninh Binh Province, Vietnam: key skeletons with which to debate the 'two layer' hypothesis.

Matsumura H, Oxenham MF, Dodo Y, Domett K, Nguyen KT, Nguyen LC, Nguyen KD, Huffer D, and Yamagata M (in press) (published online 2008)

Anthropological Science.

doi:10.1537/ase.070405

http://www.jstage.jst.go.jp/article/ase/advpub/0/advpub_0802160030/_article

2008

- Infant death in prehistoric mainland Southeast Asia.

Halcrow, S. E., Tayles, N., Livingstone, V. (2008)

Asian Perspectives 47 (2)

- The modern inhabitants of Island Southeast Asia: a craniometric perspective.

Pietrusewsky, M. (2008)

In E. Indriati (ed.) *Proceedings of the International Seminar on Southeast Asian Paleoanthropology: Recent Advances on Southeast Asian Paleoanthropology and Archaeology*, pp.185-201. Laboratory of Bioanthropology and Paleoanthropology, Faculty of Medicine Gadjah Mada University, Yogyakarta, Indonesia.

- Metric analysis of skeletal remains: methods and applications.

Pietrusewsky, M. (2008)

In Katzenberg, M.A. and S.R. Saunders (eds.) *Biological Anthropology of the Human Skeleton*. Second Edition. pp. 487-532. New York: John Wiley & Sons Inc.

2007

- Age estimation of children in prehistoric Southeast Asia: are the standards used appropriate?

Halcrow, S. E., Tayles, N., Buckley, H. R., (2007).

Journal of Archaeological Science 34, 1158-1168.

2006

- Biological responses to change in prehistoric Vietnam

Oxenham MF, (2006)

Asian Perspectives 45(2):212-239.

- Preliminary reconstruction of diet at a neolithic site in Vietnam using stable isotope and Ba/Sr analyses.

Bower NW, Yasutomo Y, Oxenham MF, Nguyen LC, and Nguyen KT. (2006)

Bulletin of the Indo-Pacific Prehistory Association, 26: 79-85.

- The Bioarchaeology of the Vat Komnouv Cemetery, Angkor Borei, Cambodia.

Pietrusewsky, M and R. Ikehara-Quebral (2006)

Bulletin of the Indo-Prehistory Association 26:86-97.

- Koh Ta Méas, un site inédit dans le baray occidental

Christophe Pottier, Phin Vichear Sachara, Heng Than, Chhay Rachna, Fabrice Demeter (2004)

UDAYA n°5, pp. 167-191.

- 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/
- 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>

Graduate Student Projects

Honours Projects:

- Subadult Identity: Attitudes towards childhood viewed from mortuary settings in Neolithic and Bronze Age Thailand.
Kenneth William Ross, 2007, Australian National University, Canberra.
Supervisor: Dr Marc Oxenham
- An Examination of Health, Stature and Disease in Bronze Age Specimens from Man Bac, Viet Nam.
Sarah Muller, 2006, Australian National University, Canberra.
Supervisor: Dr Marc Oxenham
- An Osteological Investigation into the Looted Iron-Age Remains from Koh Krabas, Northeast Cambodia.
Chris Wallwork, 2006, Australian National University, Canberra.
Supervisor: Dr Marc Oxenham
- Enamel hypoplasia as an indicator of health in a prehistoric northwest Cambodian site.
Jaime McHugh, 2007, James Cook University, Townsville, Australia
Supervisor: Dr Kate Domett
Abstract:
Enamel hypoplasia is a non-specific indicator of stress that can give a snapshot of health during growth and development in childhood. Using material collected from Phum Snay (300-500AD), a prehistoric site in Northwest Cambodia, the study of linear enamel hypoplasia at this site aims to answer three specific questions about health in childhood. Firstly, was there a significant difference in the amount of hypoplasia between males and females at this site; second, did childhood stress reduce life expectancy and finally, was there a common peak in the age of occurrence of defects? Using a biocultural approach to answer these three aims, this data is compared to other sites from Thailand and Cambodia in order to

understand the health of the inhabitants of Phum Snay within their cultural framework. These sites are Ban Chiang, Ban Na Di, Ban Lum Khao, Nong Nor, Non Nok Tha, Khok Phanom Di and Angkor Borei. Unfortunately, due to severe looting that has occurred at Phum Snay, complete skeletal remains were not able to be analysed for other indicators of stress or disease.

The results show that overall the inhabitants of Phum Snay are quite healthy and do not appear to be suffering from high rates of stress during childhood. The rates of hypoplasia are similar to those of the sites in Thailand and Cambodia. At Phum Snay there is not a statistically significant difference in the rate of enamel hypoplasia between males and females, though the rate is higher in males than females. Hypoplastic defects in this community peak between the ages of 2-4, and the impact of weaning is considered as a potential cause of this peak in frequency. It was also found that individuals with enamel hypoplasia die earlier than individuals without hypoplasia, however this group was not statistically significant. This is interpreted as a result of a weakened biological response after an initial stressor in childhood, leaving the body unable to cope with future illness, culminating in a higher rate of mortality. Phum Snay is one of few sites from the pre-Angkorian period in Cambodia and is important in understanding the lead up to the state of Angkor. Communities moving towards a state level organisation would have needed to be comprised of healthy individuals that could support themselves. Changes in health do occur over time; however from the analysis of enamel hypoplasia it would appear that the people of Phum Snay did not have a high level of physiological stress during childhood, which may have made the transition to a state level society much easier than if the population had been experiencing high levels of physical stress.

Masters Projects:

- Social Organization at the Neolithic/Bronze Age Boundary in Northern Vietnam: Man Bac Cemetery as a Case Study.

Damien Garrett Huffer, 2006, Australian National University, Canberra.

Supervisor: Dr Marc Oxenham

- Long-term effects of childhood stress on adult activity in two prehistoric skeletal samples

Kimberly Curtis, 2007. Master of Science thesis, University of Otago, Dunedin.

Supervisor: Dr Nancy Tayles

Abstract:

Childhood health and stress and adult activity have both been investigated for numerous prehistoric skeletal populations, but have never been analyzed together. Long-term effects of childhood stress may include reduced muscle development, physical activity, and physical working capacity. An analysis of skeletal evidence of childhood stress will be correlated with evidence of activity from adult skeletal remains to determine if a relationship exists between the two.

Two skeletal samples, Ban Non Wat from Northeast Thailand and Namu from Taumako, Solomon Islands, will be tested individually for correlations. The two samples are physically, geographically, culturally, and chronologically very different so as to best determine if similarities in correlations exist between the two populations. This will identify whether or not any observed trends are universal.

Reduced adult stature and linear enamel hypoplasia (LEH) are indicators of non-specific, physiological stress that occurred during childhood and are observable in adult skeletons. Robusticity of entheses (muscle attachment sites) indicate levels of activity as more robust (greater bony development) entheses are associated with intense or prolonged muscle use. Stature and LEH will be correlated with each other to determine the levels of childhood stress, and then each will be correlated with enthesial development to evaluate the relationship between childhood stress and adult activity.

No significant correlations were found between stature and LEH, stature and enthesial development, or LEH and enthesial development for either skeletal sample. Though there is a lack of correlation between the two measurements of childhood stress, stature and LEH; the fact that both samples express tall statures and low LEH frequencies compared to samples from similar chronologies and regions, indicate that neither sample experienced much stress during childhood. This apparent lack of stress means that there could be no long-term effects of childhood stress that would hinder muscle development or physical activity and working capacity.

Doctoral Theses:

- Subadult Health and Disease in Late Prehistoric Mainland Southeast Asia.

Halcrow, S. E. 2007, University of Otago, Dunedin.

Supervisor: Dr Nancy Tayles

Abstract:

There is a general belief that a decline in health of prehistoric people occurred with the adoption and intensification of agriculture. However, recent bioarchaeological research in Southeast Asia does not seem to fit this model. An investigation of subadult health is particularly useful to assess this issue because immature individuals are very responsive to environmental changes. The increase of archaeological investigation in this region has provided an adequate sample to address this important aspect of human health using subadults.

The aim of this thesis was to produce a synthesis of subadult health and disease from late prehistoric mainland Southeast Asia and assess whether there was evidence for a change in health with agricultural intensification. The samples, comprising a total 325 individuals are from seven sites in Thailand, six from the Northeast and one from the Southeast coast, and collectively span from c. 4000 to 1500 B.P. Two hypotheses were developed based on previous bioarchaeological research in Southeast Asia. Firstly, there would be maintenance in health with the intensification of agriculture. Secondly, contrary to the first hypothesis, an increase in infectious disease in the later samples was predicted.

A biocultural research approach was used, where health and disease were assessed in relationship to evidence of the natural and cultural milieu. A comparative analysis of health indicators was carried out among the sites to assess whether there were any changes in health over time in response to environmental changes. Non-specific indicators of health were used in the assessment of palaeodemography, growth, growth disruption, dental health and skeletal pathology.

Analysis of mortality, fertility, growth, growth disruption and dental health found no differences among the sites that could be explained by temporality. These results support the first hypothesis, that health was maintained. The skeletal pathology results tentatively suggested an increase in these indicators in the later sites. An analysis of multiple indicators of stress in the populations indicated a possible increase in ill health, interpreted with environmental evidence as an increase of infectious disease at the later sites. However, they suggest that the earliest site of Khok Phanom Di had extremely poor health. Thus, the second hypothesis was only partially supported.

Environmental evidence was used to provide possible explanations for these results. The heterogeneity of the health indicators support recent interpretations of localised environments of the sites. Also, retention of a broad-spectrum subsistence economy with agriculture may have overridden some of these changes that were seen in other parts of the world. Khok Phanom Di and the later sites were undergoing major changes in their natural and cultural environment, which could have resulted in an increase of infectious disease. These health results are consistent with suggestions that Khok Phanom Di was a distinct genetic population from those at the Northeast Thai sites. This biocultural interpretation emphasises the importance of understanding the environmental context in which these people lived.

- Population dynamics, growth and development in Chalcolithic sites of the Deccan Plateau, India. Gwen Robbins, 2007, Department of Anthropology University of Oregon, USA

Supervisor: Professor John Lukacs

Abstract:

This dissertation examines evidence for biodemography, settlement and subsistence strategies at three late Chalcolithic (1500-700 B.C.) sites in West-central India. Conflicting characterizations of the transition from the Early Jorwe (1500-1000 B.C.) to the Late Jorwe (1000-700 B.C.) can be found in analyses of the archaeological (Dhavalikar, 1984, 1988; Panja, 1996, 1999), archaeobotanical (Kajale, 1988), faunal (Pawankar, 1996; Thomas, 1988), and dental anthropological research (Lukacs and Walimbe, 1998, 2000, 2005). Competing models of the Late Jorwe at Inamgaon are evaluated in this dissertation using a new method for fertility-centered demography in subadult samples, long bone linear growth profiles, and an innovative approach to using long bone cross-section properties as a biocultural stress marker. This research demonstrates the potential importance of the proportion of perinatal individuals in estimating demographic characteristics using the subadult component of a skeletal sample. This dissertation also provides new insights into the role of nutritional stress in shaping long bone dimensions. In a comparison with individuals from the Denver Longitudinal Study (Ruff, 2003a, 2003b, 2005), stressed individuals from the Deccan Chalcolithic demonstrated the sensitivity of the periosteal surface to growth suppression, reduced cortical bone thickness, bone mass, medio-lateral diameter, and torsional bending strength. The results suggest no significant differences in maternal-fetal stress levels during the Early and Late Jorwe, with gestating females able to avoid high rates of small size for gestational age and premature birth. However there were significant differences in the growth profiles of infants and children for the Early and Late Jorwe at Inamgaon. The Late Jorwe is interpreted in this analysis as a period of lower life expectancy at birth, increased infant mortality, shifts in infant feeding practices toward extending the duration of exclusive breastfeeding, and increased biocultural stress levels for children. The results support a modified version of the subsistence transition hypothesis in which the Late Jorwe represented a period of demographic collapse and high subadult stress levels.

Conference Details

AUSTRALASIAN SOCIETY OF HUMAN BIOLOGY, DUNEDIN, DECEMBER 2007.

Siân Halcrow and Nancy Tayles

The 21st Australasian Society for Human Biology (ASHB) conference, co-organised by Nancy Tayles, Hallie Buckley, Kate Domett and Siân Halcrow, was held in December 2007 at the Department of Anatomy and Structural Biology, University of Otago, New Zealand. About 40 delegates, mainly from around New Zealand and Australia, but also from Canada, France and Japan, attended the conference. The conference sessions were based on Pacific, Southeast Asia, General Human Biology, Functional Anatomy, and Forensic themes. Four papers related to Southeast Asian bioarchaeology were presented and their abstracts are reproduced here. All abstracts will be published in the journal *Homo – Journal of Comparative Human Biology*.

A health index for Southeast Asia: a case study - Noen U-Loke, Thailand

Helen Cekalovic

School of Veterinary and Biomedical Sciences, James Cook University, Queensland, Australia

The use of health indices to rank archaeological skeletal samples is a relatively new tool. Whilst one has been developed for the western hemisphere, a similar index would be valuable in Southeast Asia. Health indicators include age at death, long bone length, enamel hypoplasia, dental health, trauma, joint disease and evidence of other pathologies. Noen U-Loke is an Iron Age cemetery site containing 120 excavated burials, of which 74 were adults. Using the adult data, 43 individuals (58%) were identified as having sufficient data to be placed within the health index. The health index was tested for its usefulness in ranking individuals. Two case studies are presented: the burial with the highest score and the individual who scored lowest. Burial 36 scored lowest. This individual was young, had poor childhood growth and evidence of systemic disease. The individual was thought to have osteomyelitis or tuberculosis (Tayles and Buckley, 2004). Burial 12 scored highest. The individual was an older adult, had no evidence of poor health, with only a minor deduction for dental disease. The health index shows that it is useful in ranking individuals quantitatively, which is a valuable addition to descriptive methodologies as well as those that use population/group averages. The health index can be applied to previously analysed sites, rank different status, eras, age and sex groups, as well as populations, and can also be used comparatively across disciplines, such as to compare health with burial goods or social status.

Tayles N, and Buckley HR (2004) Leprosy and Tuberculosis in Iron Age South East Asia? *American Journal of Physical Anthropology* 125:239 - 256.

Human migration in prehistoric South East Asia: the chemical and biological evidence

Katharine Cox¹ and Alex Bentley²

1. Department of Anatomy and Structural Biology, University of Otago, New Zealand

2. Department of Anthropology, Durham University, UK

As part of a larger project to examine the scale of migration at three closely spaced sites in the Upper Mun river valley of Northeast Thailand, this paper presents results of chemical analyses and dental non metric traits of human skeletal remains from Noen U-Loke, an Iron Age (c. 500BC-500AD) site. Determining the scale of migration is critical to understanding the influences from outside the region on technological changes during this time. Comparing these two methods also allows for assessment of their efficacy as indicators of migration. Migrants can also introduce diseases to a site. Three individuals at Noen U-Loke have evidence for T.B. or leprosy, diseases that are otherwise absent from the region until this time period, suggesting that these individuals were immigrants.

The evidence presented is from adult individuals at Noen U-Loke (n =36). The data shows that there are several individuals with non-local chemical signatures at the site, including those with evidence for disease. Case studies of individuals are presented as evidence for migration at the site.

A case of lower limb paralysis in an adult male dated to 3800-3400 BP, Northern Vietnam: implications for quality of life and care

Marc F Oxenham¹, Hirofumi Matsumura², Lorna Tilley¹, Nguyen Lan Cuong³, Nguyen Kim Thuy³

1. Australian National University, Australia

2. Sapporo Medical University, Japan

3. Institute of Archaeology, Hanoi, Vietnam

During the 2007 excavation season of the late neolithic (3800-3400 yrs bp) site of Man Bac, Northern Vietnam, a flexed inhumation of an adult male was recovered. A range of pathological conditions

including extensive lower limb atrophy and a completely ankylosed cervical spine informed an extensive differential diagnosis that included Klippel-Feil syndrome, ankylosing spondylitis, juvenile rheumatoid arthritis, cerebral palsy (spastic diplegia) as well as a range of infectious and traumatic (e.g. spinal cord injury) conditions. The aim of this paper is to (1) review this differential diagnosis; (2) explore the quality of life of this individual through an exploration of likely co-morbidities (minimally decubitus ulcers, bowel and bladder dysfunction and infection and respiratory infection) and; (3) develop a series of inferences regarding the level, nature and cost (to the immediate carers/family and by inference the community) of this care. It is concluded that: a definitive diagnosis is unlikely due, in part, to incomplete preservation of the skeleton, although KF syndrome receives much support; the individual was possibly immobilized since childhood; and was entirely dependent on the care of others for his daily needs. Implications regarding broader level attitudes towards life, quality of life and health care at Man Bac nearly 4,000 years ago are explored.

More on Ban Non Wat: excavation size and demography

Nancy Tayles and Siân Halcrow

Department of Anatomy and Structural Biology, University of Otago, New Zealand

Ban Non Wat is a prehistoric archaeological site in Northeast Thailand dating from 1700BC to 300AD. It has both cemetery and occupation deposits and has been the focus of a multidisciplinary research project since 2002. Excavation under this project has recently been completed, including the recovery of the skeletal remains of ~635 people. The period covered includes from the first settlers in the region through to the late prehistoric period. This provides an opportunity to trace the effects on human biology of the development from a small community with an agricultural subsistence mode but relatively undeveloped technology and uncomplicated social structure, through the acquisition of metallurgy, the expansion of trading contacts, and the intensification of farming to a population of substantial size and socio-political complexity. Research on this collection is still in its first phase but what has become abundantly clear is that the interpretation of prehistoric populations is dramatically enhanced when the extent of the excavation and the skeletal sample are large enough to ensure that the population is adequately represented. The data so far available show that the proportion of infant and child mortality changed over time but is within the expected range for prehistoric populations and that the diseases suffered by the population cover the full range from traumatic to genetic.

This research has been funded by grants from the Marsden Fund, Otago University and Earthwatch Corps.

PAPERS PRESENTED AT RECENT CONFERENCES

- Halcrow, S. E. 2007. "Stress near the start of life: Localised enamel hypoplasia of the primary canine in prehistoric Southeast Asia" Proceedings of the British Association for Biological Anthropology and Osteoarchaeology 9th Conference, Reading, UK.
- Halcrow, S. E. 2006. "Foetal death in prehistoric Southeast Asia" Proceedings of the XV Congress of the International Union of Prehistoric and Protohistoric Sciences, Lisbon, Portugal.
- Halcrow, S.E. 2006. "Endocranial new bone pathology in subadults from prehistoric Southeast Asia" Proceedings of the European Meeting of the Palaeopathological Association, Santorini

Island, Greece.

Nancy Tayles and Siân Halcrow were also invited by Rasmi Shoocongdej to present seminars to archaeological students at Silpakorn University, Bangkok in September 2007. Nancy gave an introductory seminar on bioarchaeology in Southeast Asia and the human burials from Ban Non Wat, Northeast Thailand and Siân presented one on infant and child health in late prehistoric Thailand.

- Pietrusewsky, M. 2007. "Biological connections across the Sea of Japan: a multivariate craniometric study of ancient and more modern crania from Japan, China, and Korea". 76th Annual Meeting of the American Association of Physical Anthropologists, Philadelphia, PA. March 27-April 1, 2007.
- Pietrusewsky, M. 2007 "Craniometric variation in Southeast Asia and the Indo-Pacific: a multivariate analysis of cranial measurements". Invited participant to International Seminar on Southeast Asia Paleoanthropology, Yogyakarta, Indonesia, July 23 – 29, 2007.
- Pietrusewsky, M. 2006. "The initial settlement of remote Oceania: the evidence from physical anthropology". In T. Simanjuntak, I.H.E. Pojoh and M. Hisyam (eds.) *Austronesian Diaspora and the Ethnogenesis of People in Indonesian Archipelago*. Proceedings of the International Symposium, pp. 320-347. Jakarta, Indonesia: Indonesian Institute of Sciences, LIPI Press.
- Pottier, C. "Under the Western Baray waters: Uncovering Southeast Asia's Past", 10th EurASEAA Conference, NUS Press, Singapore, 2006, pp. 298-309.

Note also that the following conferences have recently been held and abstracts are available online:

- PALEOPATHOLOGY ASSOCIATION
<http://www.paleopathology.org/2008%20Meeting%20Information%202.htm>
2008 Meeting: Columbus, Ohio, 8-9th April. Abstracts are available from this website.
- AMERICAN ASSOCIATION OF PHYSICAL ANTHROPOLOGISTS
<http://physanth.org/>
2008 Meeting: Columbus, Ohio, 7-13th April. Abstracts are available from this website.

UPCOMING CONFERENCES

- SOCIETY FOR EAST ASIAN ARCHAEOLOGY
<http://www.seaa-web.org/conf-wel.htm>
2008 meeting: Beijing, China. 2-5th June.
It is anticipated that Professor Ekaterina Pechenkina will chair a session entitled **Bioarchaeological research in East Asia** ([pechenkina\[at\]yahoo.com](mailto:pechenkina[at]yahoo.com)).
There are also sessions scheduled regarding archaeology in Southeast Asia.
- WORLD ARCHAEOLOGY CONGRESS
<http://www.worldarchaeologicalcongress.org/site/wac6.php>
<http://www.ucd.ie/wac-6/>

2008 meeting: Dublin, Ireland. 29th June – 4th July.

Colleagues attending include Drs Siân Halcrow and Marc Oxenham.

Sessions of interest to biological anthropologists include:

A cast of thousands: children in the archaeological record

Chaired by Mary Lewis (University of Reading, School of Human and Environmental Sciences) and Susan Lalonde (Headland Archaeology Ltd)

Bioethics: Critical Issues in Bioarchaeology Today. Chaired by Heather Gill-Robinson and Christina Papageorgopoulou.

Naming the Dead: The Application of Bioarchaeological Data to Forensic Anthropology and Human Identification. Chaired by Patrick Randolph-Quinney and Jean O'Connor.

- EUROPEAN ASSOCIATION OF PALEOPATHOLOGY

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

2008 meeting: Copenhagen, Denmark. 25-27th August.

Colleagues attending include Dr Kate Domett and Ms Helen Cekalovic.

- 14TH INTERNATIONAL SYMPOSIUM ON DENTAL MORPHOLOGY

http://www.medizin.uni-greifswald.de/anatomie/dental_morphology2008.html

2008 meeting: Greifswald, Germany, 27 – 30th August.

This conference includes a session organized by Professor John Lukacs entitled “Teeth and Reconstruction of the Past” during which Dr Nancy Tayles will be updating participants on the evidence for caries in Southeast Asian prehistory.

- EUROPEAN ASSOCIATION OF SOUTHEAST ASIA ARCHAEOLOGY

<http://www.iias.nl/euraseaa12/>

2008 Meeting: Leiden, Netherlands. 1-5th September.

Colleagues attending include Dr Kate Domett, Ms Helen Cekalovic, and Dr Nancy Tayles.

- BIOMEDICAL SCIENCES IN ARCHAEOLOGY

<http://hist-congress.med.uoc.gr/>

24-26 September 2008: Hersonissos, Heraklion (Crete), Greece

- INDO-PACIFIC PREHISTORY ASSOCIATION

<http://arts.anu.edu.au/arcworld/ipa/ipa.htm>

Hanoi, Vietnam. December 2009.