

Bioarchaeology in Southeast Asia and the Pacific: Newsletter

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Welcome to the eighth annual newsletter designed to update you on the latest news in the field of bioarchaeology in Southeast Asia and the Pacific. Please circulate to your colleagues and students and email me if you wish to be added to the email recipient list. This year I am starting the newsletter with a summary of the successful 2nd Southeast Asian Bioarchaeology Conference recently held in Khon Kaen, Thailand. It was at the first such meeting in 2004 that the idea for this newsletter originated.

Successful Second Southeast Asian Bioarchaeology Conference

From: Associate Professor Nancy Tayles
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Khon Kaen University, 26-28 January 2012

This conference was a belated sequel to the first conference, which was held in Siem Reap in 2004. The prime reason for the delay was the issue of venue and institutional support but this was solved when Khon Kaen University (KKU), northeast Thailand, very kindly allowed us the use of facilities there and provided both moral and material support to the conference. In particular, Associate Professor Kamoltip Brown assisted with liaison between the University and the Conference Committee, and Dr Panya Tuamsuk, together with his PhD student, Nongnuch, arranged venues, catering, and provided essential access to the very fine skeletal collection in his care in the Anatomy Department. The Conference Committee consisted of Associate Professor Nancy Tayles and Dr Siân Halcrow, from the University of Otago, New Zealand, Professor Kamoltip and Dr Panya from KKU and Associate Professor Rasmi Schoocondej from Silpakorn University, Bangkok.

The primary objectives of the conference were firstly to attempt to encourage young Southeast Asian students and researchers to consider developing their expertise in the field of Bioarchaeology, and secondly to encourage communication among researchers across the national borders of Southeast Asian countries. With these objectives in mind, the Committee aimed to attract Southeast Asian participants, and with financial support from the University of Otago and Khon Kaen University, we funded local participants to attend. We were delighted to have considerable support from Thailand, and attendances of delegates from Vietnam and Burma/Myanmar. We would have also been delighted to have others from Laos and Cambodia but despite invitations being extended, this wasn't to be, this time. Overall, we had 70 registrants, with a core of 40 who attended all three days. This included delegates from 11 countries, including India and Indonesia as well as some 'farangs' from the US and Australasia – and one from Europe.

The Conference ran over three days, with one day of podium presentations and posters, a one day workshop on skeletal biology, and one day field trip. The first day had sessions on the Current State of

Bioarchaeology in a selection of countries from Mainland Southeast Asia – Thailand, Cambodia, Vietnam and Burma/Myanmar. This was a brief summary of some current projects, and provided participants with an idea of the work being undertaken beyond the borders of their own countries. This was followed by a review of some recent developments in Bioarchaeology such as the use of ancient DNA, stable isotopes and updates on current methods in areas such as dental pathology and osteoarthritis. There was then a session on Community Involvement in Bioarchaeological (and archaeological) research, which was supported by a group of villagers from Ban Non Wat, (one of the sites in Northeast Thailand that has yielded a large sample of human skeletal remains and been the subject of numerous entries in this newsletter in previous years). This raised consciousness on the way in which researchers and local people interact, and the way in which the relationship can be one of mutual respect, valued by both parties and with positive outcomes for all. The day concluded with an interesting discussion on the future of bioarchaeology in the region of Southeast Asia and covered such topics as how to develop local expertise in bioarchaeology, what are sources of funding and training, and what are the barriers to archaeological students entering the field? We didn't come up with practical solutions to some of the problems discussed, but the sessions stimulated lively discussion and gave participants food for thought. The conference dinner was held that night at the Medical Faculty Dining Room, and was very delicious and generously funded by the President of the University, with entertainment provided by Dr Panya. During the day, a selection of interesting posters on diverse topics was available for viewing, particularly during an extended lunch break.



Participants of the 2nd Southeast Asian Bioarchaeology Meeting. The organizing committee is labeled with the exception of Dr Panya who took the photo.

The second day was the workshop, held in the Anatomy Department. This involved a series of stations on various aspects of skeletal analysis from basic bone identification through age and sex estimation to the more complex palaeopathology and the use of metrics and nonmetrics in the estimation of biological distance. The stations were run by PhD and other senior students and Thai researchers with expertise.

The third day was the field trip, which involved firstly a tour of the very extensive KKU Campus, and then travelling from Khon Kaen to the Phimai region, two hours south. The participants visited the Khmer temple of Prasat Hin Phimai (for those of you who don't know this temple, it dates from the Angkorian period and is a very fine example of temple complexes from that period). They were then treated to a very fine lunch at the nearby Sai Ngaam, the largest Banyan Tree in the world, and in the afternoon they travelled to Ban Non Wat, where Dr Nigel Chang, from James Cook University, Australia, who co-directs an ongoing archaeological research project at the site, gave a tour of the site and explained the findings of the excavations. This site has yielded a collection of over 700 burials to

date so is an important contributor to Southeast Asian Bioarchaeology. Conference participants viewed the partially constructed Museum being built to house finds from the site, and had the opportunity to informally talk with the local villagers and purchase local handicrafts. The trip had been intended to include a visit to the newly constructed skeletal collection storage building at the Fine Arts Department Regional Office in Phimai but unfortunately-timed road works precluded this visit.



A. Stephanie Shkrum (to the right of photo) from NZ discussing dental pathology during the workshop. B. Korakot Booklop (centre) from Thailand guiding participants Terrence Tan (left) from Myanmar and Wilsinee Chamsaar (right) from Thailand during the workshop.

Overall, the conference was deemed a success. We await final evaluations, which are being compiled by Dr Panya, but if the level of conversation and evident enjoyment by participants throughout the three days is any guide, we were successful in achieving the conference aims. Everyone was very keen to see the conference repeated and extended, although the question of finding another venue and institutional support remains. We will keep you posted!



A. Some participants at the Prasat Hin Phimai. Associate Professor Kamoltip Brown (centre in blue dress) from Khon Kaen University, was one of the conferences key organizers. B. Some more participants at the Phimai Prasart. Dr Panya Tuamsuk (3rd from the left) from Khon Kaen University, another of the conference key organizers.

Again, it is essential to acknowledge the myriad tasks undertaken by the team at KKU, who kept participants housed, fed, transported and entertained. We thank speakers at the podium sessions and poster presenters. We particularly thank Dr Nigel Chang and the team from Ban Non Wat who added a dimension that would otherwise have been missing from the conference. For the workshop, we thank helpers at the various stations. We also gratefully acknowledge the financial contributions of the University of Otago Dean of Medical Sciences, the President of KKU and the Medical Faculty at KKU.

Nancy Tayles and Siân Halcrow, on behalf of the Organising Committee

News

PACIFIC

From: Dr Hallie Buckley

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In August/September further excavation of the Lapita cemetery site on Uripiv Island was carried out. The excavation was conducted under the the direction of Dr Stuart Bedford from The Australian National University and the Malakula Cultural Centre. Dr Hallie Buckley and Dr Frederique Valentin were assisted by students from the University of Otago (New Zealand), Aimee Foster and Neil Dudley, student Angélique Vétral from Université Paris 1 (France), and by Jacques Bolé from IANCP (New Caledonia). A total of 38 burials have been identified and excavated from this site to date.

In July-September Dr Rebecca Kinaston spent a good deal of time in the field collecting modern plant and animal samples from NE Malakula and Efate islands for stable isotope analyses to compile a dietary baseline for the interpretation of prehistoric diet in the region.

Dr Rebecca Kinaston, Ms Julie Roberts and Ms Angélique Vétral cleaning up the top of the Lapita beach level surface on Uripiv Island.



INDONESIA

From: Dr Hallie Buckley

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Dr Hallie Buckley travelled to Flores Island with Dr Jean-Christophe Galipaud, IRD France, and Professor Truman Simanjuntak, National Research and Development Center for Archaeology, Indonesia, to set up a new project excavating early Austronesian burials in East Flores Island. Excavations will commence in July 2012.

THAILAND

From: Dr. Siân Halcrow and Nathan Harris
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Subject: *Recent excavations at Non Ban Jak, northeast Thailand.*

The first season of excavations at Non Ban Jak in Nakhon Ratchasima Province, northeast Thailand took place between the 1st November and 10th December 2011. This was carried out as part of the larger project, *From Paddy to Pura: The Origins of Angkor*, through an Australian Research Council grant (CI Dougald O'Reilly, ANU). The aim of the project is to assess the development of sociopolitical complexity in Cambodia and Thailand before the Angkorian period. Occupied between c. 500 BCE and 500 CE, Non Ban Jak is one of the classic Iron Age 'moated' sites seen in the Upper Mun River valley. Interestingly, there were a series of floors and what appear to be walls, which have been interpreted by Prof. Charles Higham (excavation director) as evidence for a residential quarter.

Dr Siân Halcrow and Nathan Harris, assisted by Danielle Dyer, worked on the human remains at the site. A total of nine skeletons were uncovered, recorded, removed, and transported to the Bone Storage Facility at the Fine Arts Department in Phimai. Skeletons were cleaned and inventoried at the laboratory, and a preliminary analysis undertaken. Dr Halcrow plans to return to complete her analyses of the remains at the end of the year.

CAMBODIA

From: Kate Domett and Jennifer Newton
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Subject: *Excavations at Lovea, Cambodia*

The site of Phum Lovea was excavated during December 2011 to January 2012. Phum Lovea is situated just north-west of Siem Reap, near the Angkor Park, and is considered to be from the late Iron Age. This excavation was the second excavation to be undertaken as part of the ARC funded *From Paddy to Pura* project mentioned above in the Thailand section; the Authority for the Protection and Management of Angkor and the Region of Siem Reap (APSARA) were also involved. Dr Dougald O'Reilly (Australian National University), Dr Louise Shewan (University of Sydney), and Dr Kate Domett (James Cook University) participated in the excavation. Assisting Kate with the removal of human remains was Jennifer Newton (PhD candidate at James Cook University).

A total of 11 burials were excavated, however, some burials contained more than one individual as a result of disturbance so at this early stage we believe there were 13 individuals. Preservation of the skeletal remains is quite poor, with most of the skeletal material being quite damp and fragile. Initial *in situ* analysis has determined 11 of the 13 individuals to be adult, while the other two burials are fragmented and age cannot be determined at this stage. Further analysis of the remains will take place in May 2012 when Kate and Jen visit Siem Reap.



LEFT: The poorly preserved skeletons at Phum Lovea. RIGHT: Student volunteers cleaning bone in Siem Reap, Cambodia. From left to right: Tanya Erofeev (ANU), Christina Alonso (USA) and Samantha Rowbotham (ANU).

From: Nancy Beavan

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Subject: *Jar and Coffin Burial Project, Cardamom Mountains, Cambodia: Progress Update*

Since 2003 we have steadily worked on the Cardamom Jar and Coffin Burial Project to geo-locate, survey and complete radiocarbon dating for an unusual mortuary ritual found in the Cardamom Mountains of southern Cambodia. Our project team includes Siân Halcrow (University of Otago, NZ), Bruce McFadgen (Victoria University, NZ), Derek Hamilton (SUERC, Scotland), Brendan Buckley (Lamont Doherty Earth Observatory, Columbia University, USA), Tep Sokha (Royal University of Fine Arts, Cambodia), Louise Shewan (University of Sydney), John Miksic (National University Singapore), Ouk Sokha (Ministry of Culture and Fine Arts, Cambodia), Stewart Fallon, Dougald O'Reilly and Richard Armstrong (Australian National University), Kate Domett (James Cook University, Australia), and K R. Chhem (Ulm University, Germany). Fieldwork and isotopic analyses have been supported by a University of Sydney Research and Development Fund (2007), an Australian Research Council (ARC) Discovery Grant DP0984968 (2008/11), the Otago School of Medical Sciences (2010-2011), and the Ragano Family Trust (2010-2011).

Ten sites have now been identified which range over approximately 72 km in a NE by SW line in the eastern ranges of the Cardamom massif. The ritual practice uses 53cm high ceramic storage jars, and coffins fashioned from locally harvested trees to contain the secondary burials of human skeletal

remains. The jars and coffins were then placed upon rock ledges. The burial jars are from the Maenam Noi kilns of Singburi province, central Thailand, which were in production as early as the 14th to perhaps the 16th centuries AD (Shaw 2009:31; Grave and Maccheroni 2009:201, Brown 2004; Pariwat et al. 1996). These trade-ware ceramics were part of the cargoes of nautical traders in the Gulf of Thailand from at least the 14th century AD (Brown 2004); one example is the cargo of the Koh S’dech shipwreck found in 2005 of the coast of Koh Kong on the south-western coast of Cambodia, which three of us (NB, TS, OS) have been studying for the past year and will report on in a future Newsletter. The extensive use of these Maenam Noi jars as burial containers – some 75 such jars have been found in the ten Jar and Coffin burial sites – suggests some form of connection between the highland people who used this mortuary ritual and the supra-cultural nautical trade networks of the period.

In January 2012 several members of the Project team (Nancy Beavan, Siân Halcrow, Tep Sokha and Ouk Sokha) began work on the largest of these sites, *Phnom Khnang Pueng*, and a second field season in January 2013 will be required to complete our work there. The site is at 600m ASL and lies within the Khampong Speau province boundary. *Phnom Khnang Pueng* incorporates 54 of the Maenam Noi burial jars – by far the largest number of burial jars ever discovered in one site - and several coffins. Photojournalist Luke Duggleby also accompanied us on the *Phnom Khnang Peung* fieldwork, and an online collection of Luke’s photographs from the January 2012 fieldwork can be viewed at:

<http://www.lukeduggleby.com/#/cambodia/cambodia--the-mystery-of-the-jar-people/JarPeople004>



Figure 1a) Khnonrg Sroal jar burial site (photo: J. Miksic); b) Phnom Pel site coffin ledge (photo: Ouk S.); c) Tep Sokha at the Phnom Pel jar ledge (photo: Ouk S.); d) Ceramic conservation work undertaken in the field (photo: Ouk S.).

The Cardamom Jar and Coffin Burial Project now has a suite of 36 AMS radiocarbon ages from human skeletal remains and coffin wood, including new results from the January 2012 fieldwork. The corpus of radiocarbon ages from five of the sites has begun to define a time span from the late 14th to mid-17th centuries AD for this distinctive burial ritual of the highlands. As these sites may be the only archaeological evidence for a highland culture in the Late- to Post-Angkor period, heritage protection plays a significant role in our project planning and aims. Preservation of each site includes ceramics conservation in the field, which is probably a first for Southeast Asian fieldwork. Publication of the first 28 radiocarbon results from four of the Cardamom sites will appear in an upcoming issue of the journal *Radiocarbon*.

References

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- Grave P, Maccheroni M. 2009. Characterizing Asian Stoneware Jar Production at the Transition to the Early Modern Period, 1550-1650. In *Scientific Research on Historic Asian Ceramics. Proceedings of the Fourth Forbes Symposium at the Freer Gallery of Art*. McCarthy B, E Salzman Chase, Cort LA, Douglas JG, and Jett P. (eds) London: Archetype Publications Ltd. 110pp
- Pariwat T, Lertrit S, da Pinsri K. 1996. *Sinlapa khruāng thūai nai Prathēt Thai (Ceramic Art in Thailand)*. 2nd ed. Bangkok: Ostospa Co. Ltd.
- Shaw JC. 1987. *Introducing Thai Ceramics; also Burmese and Khmer*. Chiang Mai: Duangphorn Kemasingki. 230pp.

LAOS

From: Stacey Ward
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Subject: *Analysis of cremated remains in Vientiane, Laos*

In July 2011 Stacey Ward visited the Lao National Museum, Vientiane, Laos, to undertake the study of a small but significant sample of human remains, including twenty-three cremations and one inhumation burial from the Lan Xang period (1353 – c. 1695 CE), and one inhumation burial from the Iron Age (420 BCE – 500 CE). These remains were discovered in 2006 – 2007 during salvage excavations held alongside the upgrade of the section of Asian Highway 12 that passes through central Vientiane. These excavations were a collaboration between the Lao Government and the Japanese International Co-operation Agency. The remains discovered provided a rare opportunity to study Southeast Asian cremation burials, a subject on which bioarchaeological information is lacking.

The 2011 visit involved identifying the excavated bone fragments to element and side, determining the number of individuals in the sample, estimating their ages and sexes, identifying evidence of pathology and finally recording this information alongside cremation information for later analysis at the University of Otago. Poor preservation of the sample made some of these tasks, such as sex estimation, difficult. Other challenges involved in this study were the excavation of the plaster-covered Iron Age burial from its plaster block, which was achieved through the liberal use of hammers, and starring in a youtube video!

<http://www.youtube.com/watch?v=zYmHbPgVGs0>

Stacey's analyses of the Vientiane sample will form the final report on the human remains for the Lao/Japanese teams and also formed the basis of her recently submitted MSc thesis (see full abstract in later section). Portions of this thesis are currently being prepared for publication.

Permission for this study was granted by Thongsasayavongkhamdy (Director general, Heritage Department, Ministry of Information, Culture and Tourism). This study was supervised by Dr. Nancy Tayles (University of Otago) and assisted by Marion Ravenscroft (Conservator, Lao National Museum) and Naho Shimizu (Freelance Archaeologist, Lao National Museum).

Recent Publications

A reminder about the online bibliography for Southeast Asian archaeology at <http://seasia.museum.upenn.edu/> Click on left image to access. You will need to establish a login, but it is very simple and quick. There are lots of bioarchaeology references, and anyone should feel free to send us their publication to be included.

- Adler, C.J., W Haak, D Donlon, A Cooper, TG Consortium. 2011. Survival and recovery of DNA from ancient teeth and bones *Journal of Archaeological Science* 38:956-964.
- Briggs, C., Donlon, D and Wood, W. 2010 Forensic Osteology, Chapter 35. In Freckelton, I and Selby, H. *Expert Evidence*. Thomson Reuters.
- Adler, C.J. and Donlon, D. 2010. Sexual dimorphism in deciduous crown traits of a European derived Australian sample *Forensic Science International* 199(1-3):29-37
- Beavan, N., Tep, S., Ouk, S. and Halcrow, S. (2011) To discover and preserve: the first recording, analysis and site conservation of the 15th to 17th century Jar and Coffin Burials in the Cardamom Mountains, Kingdom of Cambodia. In: *Proceedings of the Conference on Conservation and Development of Khmer Culture: "Culture Heritage"* Royal Academy of Cambodia. pp. 109-141.
- Beavan, N., Halcrow, S. E., McFadgen, B., Hamilton, D., Buckley, B., Tep, S., Shewan, L., Ouk, S., Fallon, S., Miksic, J., Armstrong, R., O'Reilly, D., Domett, K., and Chhem, R. (in press). Radiocarbon dates from Jar and Coffin Burials of the Cardamom Mountains reveal a previously unrecorded mortuary ritual in Cambodia's late- to post-Angkor period (15th to 17th centuries AD). *Radiocarbon*.
- Bedford, S., Buckley, H. R., Valentin, F., Tayles, N. and Longga, N. F. (2011) Lapita burials, a new Lapita cemetery and post-Lapita burials from Malakula, Northern Vanuatu, Southwest Pacific. *Journal of Pacific Archaeology*, 2(2):26-48.
- Bentley, R. A., Cox, K., Tayles, N., Higham, C., Macpherson, C., Nowell, G., Cooper, M. and Hayes, T. E. F. (2011) Community diversity at Ban Lum Khao, Thailand: Isotopic evidence from the skeletons. *Asian Perspectives*, 48(1):79-97.
- Buckley, H. R. (2011) Epidemiology of Gout: Perspectives from the Past. *Current Rheumatology Reviews*, 7:106-113.

- David Bulbeck. 2011. Biological and cultural evolution in the population and culture history of Malaya's anatomically modern inhabitants. In Nick Enfield (ed.), *Dynamics of Human Diversity: The Case of Mainland Southeast Asia*, pp. 207–255. Pacific Linguistics 627. Canberra: The Australian National University.

This contribution places the results of osteological and genetic (mtDNA) research on the *Orang Asli* (indigenous people) of the Malay Peninsula in the context of the Peninsula's prehistoric and historic archaeology. The cobble-based Hoabinhian lithic technology is argued to have local Late Pleistocene roots that may reach back to the Kota Tampan site covered by ash fall from the Toba volcanic explosion 74,000 years ago. Early Neolithic influences including pottery and plant management strategies can be dated back to the early Holocene, slightly preceding the mid-Holocene tradition of extended burials with fine grave goods apparently associated with the introduction of Austroasiatic languages to the Peninsula. The skeletal record demonstrates an approximately ten percent reduction in stature between the early Holocene and ethnographic times, associated with the expression of a more gracile cranial morphology. The causes for stature reduction are argued to include adaptation to tropical rainforest conditions and restricted dietary breadth. While all *Orang Asli* groups and the culturally dominant Malays trace at least some of their mtDNA ancestry back to the Late Pleistocene, several stages of introduction of exogenous mtDNA haplogroups can be reconstructed dating between the early Holocene and the establishment of the Malay sultanates. Each of these stages (as of the mid-Holocene) appears to have been associated with the marginalisation of the previously dominant population, which was a source of local wives for immigrant men but whose menfolk did not receive wives in return.

- Clark, A.L., Tayles, N., and Halcrow, S.E. (*in press*) Sexual Dimorphism in Adult Skeletal Remains at Ban Non Wat, Thailand, during the Intensification of Agriculture in Early Prehistoric Southeast Asia. In: Mitchell, P and Buckberry, J (eds) *Proceedings of the 12th Annual BBAO Conference September 2010*. British Archaeological Reports Series. Archaeopress: Oxford, pp. 17-28.
- Cox, K. J., Bentley, R. A., Tayles, N., Buckley, H. R., Macpherson, C. G. and Cooper, M. J. (2011) Intrinsic or extrinsic population growth in Iron Age northeast Thailand? The evidence from isotopic analysis. *Journal of Archaeological Science*, 38:665-671.
- Domett, K. M., Newton, J., O'Reilly, D. J. W., Tayles, N., Shewan, L. and Beavan, N. (*in press*) Cultural modification of the dentition in prehistoric Cambodia. *International Journal of Osteoarchaeology*, DOI: 10.1002/oa.1245.

Intentional dental modification, in the form of ablation and filing, is reported for the first time from Cambodia in two late prehistoric sites (Phum Snay and Phum Sophy, c. 2500 to 1500 yrs BP). Bioarchaeological research is relatively new for this region and this study significantly adds to our reconstruction of past behaviours in mainland Southeast Asia. The skeletal samples combine both excavated material and large looted collections in the form of ossuaries. People from Phum Snay and Phum Sophy had similar rates of anterior maxillary dental ablation, 60% and 47% respectively, and 21.4% and 7.7%, respectively, in the mandible. Patterns of ablation most commonly involve the removal of the maxillary lateral incisors. Intentional filing was less common than ablation but affected Phum Snay and Phum Sophy individuals to a similar level (4-7%). Filing was also restricted to the anterior dentition and a range of patterns were evident, many involving filing of the mesial and distal aspect of the crown of the upper and lower incisors and canines to give a pointed appearance. Patterns of ablation or filing were not strongly associated with a particular sex or age group. However, a limited number of ablation and filing patterns were exclusive to each site. The significance of this practice in relation to rites of passage, status, community and family relationships, and trauma is discussed. It is also shown that the modifications show distinct differences in prevalence and pattern, particularly that of filing, to nearby temporal neighbours in southern Cambodia and northeast Thailand suggesting a unique cultural behaviour for this region.

- Domett, K. M., Reilly, D. J. W. and Buckley, H. R. (2011) Bioarchaeological evidence for conflict in Iron Age north-west Cambodia. *Antiquity*, 85:4412-458.

Examination of skeletal material from graves at Phum Snay in north-west Cambodia revealed an exceptionally high number of injuries, especially to the head, likely to have been caused by interpersonal violence. The graves also contain a quantity of swords and other offensive weapons used in conflict. The authors propose a context for these warriors in the struggle between emergent polities in the Iron Age before the domination of Angkor.

- Domett K, and Buckley H, R. (in press accepted November 2010). Large Lytic Cranial Lesions: a differential diagnosis from Pre-Angkorian Cambodia. *Int J Osteoarchaeol*. DOI: 10.1002/oa.1234.
A late pre-Angkorian period, c. AD 75-300 AD, cemetery has been excavated in the village of Phum Snay, in northwestern Cambodia. In addition to the cemetery sample, a large sample of stratigraphically unprovenanced human skeletal material was uncovered in the village through extensive looting over the last 5-10 years. Both sample sets were available for study but the latter is comprised of only isolated bone elements. The differential diagnosis of the cause of lesions in one isolated cranial vault from this sample is presented here. Widespread, primarily lytic, lesions are concentrated on the frontal and anterior parietal bones, with an additional large lesion on the occipital bone. Lesions vary in size ranging from approximately 5mm to 30mm in diameter. A detailed description of these lesions is given and a differential diagnosis is presented that includes infectious disease, such as osteomyelitis, tuberculosis, and treponemal disease, and also several forms of cancer including metastatic carcinoma, meningioma, and multiple myeloma, and finally Langerhans Cell Histiocytosis. The diagnosis is difficult given the lack of material but it is suggested that one of the forms of Langerhans Cell Histiocytosis is the most likely candidate. The presence of such large and diffuse lesions is unusual in prehistoric Southeast Asia so the significance of this is also discussed.
- Donlon, D. and J. Littleton (2011). Physical Anthropology and legislation in Australia. In N. Marquez-Grant and L. Fibiger (eds) *The Routledge Handbook of Archaeological Human Remains and Legislation: an international guide to laws and practice in the excavation, study and treatment of archaeological human remains*. Routledge.
- Douglas, Michele Toomay and Michael Pietrusewsky (2012) Vulcan: Skilled village craftsman of Ban Chiang, Thailand. Chapter 12. In *Bioarchaeology of Individuals*, edited by Ann L.W. Stodder and Ann W. Palkovich. Gainesville: University of Florida Press. Pp 177-192
- Halcrow, S. E., Tayles, N., Inglis, R. M., and Higham, C. F. W. (in press). Newborn Twins from Prehistoric Mainland Southeast Asia: Birth, Death and Personhood. *Antiquity*.
- Halcrow, S., Tayles, N., Pureepatpong, N. and Boonlop, K. (2011) Human remains from archaeological sites in Thailand: legislative and ethical issues (in Thai). *Muang Boran Journal*, 37(3):143-148.
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- Halcrow, S.E. and Tayles, N. (2011) The bioarchaeological investigation of children and childhood. In: *Social Bioarchaeology*. Agarwal, S.C. and Glencross, B.A. (eds). Wiley-Blackwell. pp. 333-360.
- Halcrow, S.E. and Tayles, N. (2011) Human diversity in Mainland Southeast Asia: the contribution of bioarchaeology. In: N.J. Enfield (ed.) *Dynamics of human diversity*. Canberra, Australia: Pacific Linguistics. pp. 47-61.
- Harris, N. J. and Tayles, N. (2012) Burial containers – A hidden aspect of mortuary practices: Archaeoethanatology at Ban Non Wat, Thailand. *Journal of Anthropological Archaeology* 31:227-239.
- Hayes, S., Buckley, H., Bradley, R., Milne, N. and Dennison, J. (2011) Approximating the face of 'Aunty': a question of likeness. *Journal of Archaeological Method and Theory*, DOI 10.1007/s10816-011-9115-2.

- Heathcote, G. Vincent P Diego, Hajime Ishida and Vincent Sava (2012). Legendary Chamorro strength: Skeletal embodiment and the boundaries of interpretation Chapter 4. In *Bioarchaeology of Individuals*, edited by Ann L.W. Stodder and Ann W. Palkovich. Gainesville: University of Florida Press. pp. 44-67.
- Higham C.F.W., R. Ciarla, T.F.G. Higham, A. Kijngam and F. Rispoli 2011. The establishment of the Bronze Age in Southeast Asia. *Journal of World Prehistory*, 24 (4), 227-274.
- Higham C.F.W., T.F.G. Higham and A. Kijngam 2011. Cutting a Gordian Knot: The Bronze Age of Southeast Asia, timing, origins and impact. *Antiquity* 85:583-98.

Ban Chiang has been prominent in a number of papers on human biology in Southeast Asia. However, the chronology of this site has been controversial since claims were made in 1976 for a remarkably early beginning to both the Bronze and Iron Ages. Charles and Thomas Higham have recently undertaken a new dating programme for this site, employing the latest ultrafiltration pretreatment to obtain determinations from human bone and the bones of the pigs interred with the dead. The results are reported in the journal *Antiquity*, with a longer paper presenting the results in the context of East Asian prehistory in the *Journal of World Prehistory*. These indicate that the initial Neolithic settlement took place in the 16th century BC, while the transition into the Bronze Age took place in about 1000 BC.

- King, C. L., Tayles, N. and Gordon, K. C. (2011) Re-examining the chemical evaluation of diagenesis in human bone apatite. *Journal of Archaeological Science*, 38:2222-2230.
- Natthamon Pureepatpong, Arraya Sangiampongsa, Tanongsak Lerdpipatworakul, Sanjai Sangvichien. (2012) Stature Estimation of Modern Thais from Long bones: A Cadaveric study. *Siriraj Medical Journal*; 64 (Suppl 1): S22-S25.

Objective: The lengths of long bones of adult skeletons are commonly used to estimate stature. The regression equations for calculating stature were established from the relationship between the height and the length of long bones.

Methods: We measured 275 adults, ranging in age from 25 to 97 years. The length of six long bones; humerus, radius, ulna, femur, tibia and fibula were measured out. For both femur and tibia, they were measured in 2 different methods; maximum length and anatomical length. Microsoft Excel 2003 and Minitab 14, a statistical computer software ($\alpha = 0.05$) were used to calculate and establish the regression equations for stature estimation of three groups of the differently sexual identification; male, female and unknown sex.

Results: The length of two long bones, especially femur (max) + tibia (max) provides the most accuracy of stature estimation in all three groups. For the one long bone length, femur is the most accurate in every group.

Conclusion: The overall of the results show that the upper extremities present the accuracy of stature estimation more than the lower extremities (except femur) in the male group. On the other hand, femur, tibia and fibula of the female group provide more accurate stature estimation than the upper extremities.

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E-journal: <http://www.sirirajmedj.com>

- Storey, A. A., Quiroz, D., Beavan, N. and Matisoo-Smith, E. A. (2011) Pre-Columbian chickens of the Americas: a critical review of the hypotheses and evidence for their origins. *Rapa Nui Journal*, 25(5):5-19.
- Pietrusewsky, M. (In press) Biological Distance. In: Smith, C. (editor). *Encyclopedia of Global Archaeology*. New York: Springer.
- Robinson, M., D. Donlon, H. Harrison, M. Houang, H. Stammberger, G. Wolf 2010 Variations of the paranasal sinuses in Melanesians as observed by CT. *Rhinology* 48:11-17.
- Tayles, N. and Halcrow, S. (2011) New Zealand/Aotearoa. In: N. Márquez-Grant and L. Fibiger (eds.) *The Routledge handbook of archaeological human remains and legislation*. London, UK: Routledge. pp. 647-655

- Tayles, N., S. E. Halcrow and N. Pureepatpong (in press). Southeast Asia. J. Buikstra and C. Roberts (eds) *History of Palaeopathology Pioneers*. Oxford: Oxford University Press. 1360-1396.
- Thomas J. Zumbroich and A. Salvador-Amores. 2011. Gold Work, Filing and Blackened Teeth: Dental Modifications in Luzon. *Cordillera Review* 2(2): 3-42.

A review that summarizes and contextualizes the evidence for different forms of dental modifications from the archaeological record of the fourteenth century C.E. to the present date for different ethno-linguistic groups in Luzon, Philippines.

New Books

- *Bioarchaeology of Individuals*, edited by Ann L.W. Stodder and Ann W. Palkovich. Gainesville: University of Florida Press.

“This important book.....reminds the reader that each person in a population is part of the larger record, a part of the larger story that is crucial for understanding variation and evolution.....” Clark Spencer Larsen, preface.

- *Dynamics of Human Diversity: The case of mainland Southeast Asia*. NJ Enfield (editor). Published by *Pacific Linguistics*.

http://pacling.anu.edu.au/catalogue/book_pages/600-plus/627.html (order form at end of newsletter).

Anyone who would like a pdf of Joyce White’s chapter may contact her directly at banchang@sas.upenn.edu

Chapters:

1. Dynamics of human diversity in Mainland Southeast Asia: an introduction. NJ Enfield
2. Cultural diversity in Mainland Southeast Asia: a view from prehistory. Joyce White
3. Human diversity in Mainland Southeast Asia: the contribution of bioarchaeology. Siân Halcrow and Nancy Tayles
4. Linguistic diversity in Mainland Southeast Asia. NJ Enfield
5. mtDNA variation and southward Holocene human dispersals within Mainland Southeast Asia. Stephen Oppenheimer
6. Ethnology and the issue of human diversity in Mainland Southeast Asia. Hjorleifur Jonsson
7. The role of agriculture in the evolution of Mainland Southeast Asian language phyla. Roger Blench
8. Population history of MSEA: The two layer hypothesis in the context of northern Vietnam. Hirofumi Matsumura, Marc Oxenham, Nguyen Kim Thuy, Nguyen Lan Cuong, Nguyen Kim Dung
9. A physical anthropology perspective on a Mainland Southeast Asian agrarian population: prehistoric skulls of Ban Chiang. Korokot Boonlop and Sureeratana Bubpha
10. Biological and cultural evolution in the population and culture history of *Homo sapiens* in Malaya. David Bulbeck.
11. Language history and culture groups among Austroasiatic-speaking foragers of the Malay Peninsula. Nicolas Burenhult, Nicole Kruspe and Michael Dunn
12. Origin and genetic diversity among Malaysian Orang Asli: an alternative explanation to the demic diffusion model. Alan Fix
13. Austroasiatic word histories: boat, husked rice and taro. Gérard Diffolth

14. The Austroasiatic Urheimat: the Southern Riverine Hypothesis. Paul Sidwell and Roger Blench
15. The Austroasiatics: East to West or West to East? Laurent Sagart
16. Rice and the Austroasiatic and Hmong-Mien homelands. George van Driem

Conference Details

PAPERS PRESENTED AT RECENT CONFERENCES

- **81st Annual Meeting of the American Association of Physical Anthropologists**

Oregon, April 11 - 14, 2012.

Abstracts are available from <http://physanth.org/annual-meeting/2012>

- **80th Annual Meeting of the American Association of Physical Anthropologists**

Minneapolis, MN, April 13 - 16, 2011

Abstracts are available from <http://physanth.org/annual-meeting/2011>

The following are two abstracts presented at the Minneapolis conference sent in by colleagues:

- An assessment of health and lifestyle among pre-1521 Chamorro from Saipan, Commonwealth of the Northern Mariana Islands. MICHAEL PIETRUSEWSKY¹, MICHELE TOOMAY DOUGLAS¹, MARILYN SWIFT², RANDY HARPER², MICHAEL A. FLEMING². ¹Department of Anthropology, University of Hawaii at Manoa, ²Swift and Harper Archaeological Resource Consulting, Saipan.

An earlier investigation of health and disease in the Mariana Islands (Guam, Rota, Tinian, and Saipan) suggested that the prehistoric inhabitants of Saipan experienced more stress than the prehistoric Chamorro living on Guam. Utilizing general and specific indicators of stress recorded in skeletal remains from two recently excavated sites on Saipan, the Chalan Monsignor Guerreo Road Project (CGM) and the Beach Road Sewer System (BRSS) sites, this new study focuses on the health and lifestyle of pre-1521 Chamorro living on Saipan. Chamorro subsistence economies included reliance on cultivated tree and root crops, fishing, and possibly rice. The non-specific indicators of systemic stress investigated include cribra orbitalia (CO), LEH, and stature. The more specific stressors examined include trauma, infection, and dental disease (e.g., AMTL, caries, dental abscess, etc.). With the exception of significantly lower dental caries prevalence ($P = 0.0001$) in the new Saipan series, the frequencies of stress indicators are similar in the skeletal series from Saipan. Comparisons between Saipan and Guam reveal significantly higher frequencies of CO, AMTL, and dental attrition and lower frequencies of dental caries in the Saipan series. Although not significant, slightly higher frequencies of treponemal infection and limb bone fractures are observed in the Saipan series. The results of this new study provide partial support of the earlier assessment that the prehistoric inhabitants of Saipan were subjected to greater stress levels than those living on Guam. Cultural habits such as chewing betel-nut and other environmental and cultural differences are examined to explain these results.

Figure: Michael Pietrusewsky standing in front of his poster at the American Association of Physical Anthropologists Meeting, Minneapolis, MN, April, 2011



- Clark, A.L, Halcrow, S.E and Tayles, N (2011) *Indicators of physiological stress in early prehistoric Southeast Asia during agricultural intensification.*

This paper examines patterns of health and physiological stress in early prehistoric Southeast Asia. Previous studies of skeletal remains have demonstrated that as agriculture intensifies, levels of poor health and physiological stress increase. Current research in Southeast Asia suggests, however, that this trend differs depending on the world region under investigation. However, the transition to rice based subsistence strategy in this region is not well understood compared to other geographic regions. The hypothesis that levels of health and stress are more stable in prehistoric Southeast Asian populations compared to that of Western populations during agricultural intensification, is therefore, tested. Here, a large prehistoric adult sample from Ban Non Wat, Thailand, spanning 1750 B.C to 500 A.D, are examined. The skeletal sample spans the Neolithic and Bronze Age during the use and intensification of rice agriculture.

Individual dentition was scored for linear enamel hypoplasia (LEH), as an established measure of physiological stress in early childhood. Adult stature was estimated as another general measure of health in early childhood. The relationship between individual stature and prevalence of LEH are explored. The differences between males and females are also tested. Initial results indicate an increase in stature for both males and females, and no significant change in the prevalence of LEH. Overall, this evidence supports theories that health and stress do not decline during the intensification of rice agriculture in Southeast Asia. Future research will further test this relationship.

- ***Annual Meeting of the Paleopathology Association***

The North American version of this meeting was held just prior to the American Association of Physical Anthropology Annual meetings. The abstracts are available here:

http://www.paleopathology.org/2012_Meeting_Info.html

- ***Australasian Society of Human Biology***

<http://school.anhb.uwa.edu.au/ashb/index.html>

The 25th Annual ASHB conference was held at the Australian National University, Canberra from the 27th of November-1st December 2011. Of interest to bioarchaeologists, keynote addresses were delivered by Professor Jane Buikstra, Professor Emeritus John Lukacs and Dr Harry Widiyanto. A number of other papers at the conference included bioarchaeology research in Southeast Asia and the Pacific:

- A survey of 10 years of forensic anthropology casework in NSW and South Australia. Denise Donlon

While forensic anthropology is growing in importance in Australia, there is not a real sense of the quantity and scope of the work. There is a great interest in the field from students and it is hoped that a survey of case work from two states, New South Wales and South Australia, will give an idea of the practice of the discipline and how the it has developed as well as stimulating areas of future research. The following aspects of cases were examined over a period of ten years; the number and types of cases, the agency which commissioned them, demographic profile, terrain, season found and some preliminary taphonomic considerations. There were no great surprises when it came to the demographic profile however the terrain and the seasons in which remains were found were unexpected. The increase in casework has been slow but consistently growing. The types of cases are highly varied with non-human bones being most frequent. An examination of changes over the period has thrown light on the growth and expansion of the field of forensic anthropology in New South Wales and may help to predict what might happen in this discipline in the future.

- A comparison of cortical bone thickness between the human humerus and non-human limb bones: challenges for identification. Sarah Croker (University of Sydney), Warren Read and Denise Donlon.
- The Neolithic demographic transition and demic diffusion in Southeast Asia: the evidence from Man Bac. Marc Oxenham (ANU), Hirofumi Matsumura, Kenichi Shinoda, Damien Huffer and Anna Willis.

- I'm a stranger here myself: migration and community organization during the Northern Vietnamese mid-Holocene. Damien Huffer (ANU), Marc Oxenham, Richard Armstrong.
- The bones that talk: searching for Lapita mortuary practices through taphonomy. Neil Dudley (University of Otago), Hallie Buckley, Glen Summerhayes.
- New Lapita and post-Lapita burials from Uripiv Island, Northeast Malakula, Vanuatu: putting the Teouma people into context. Hallie Buckley (University of Otago), Stuart Bedford, Frederique Valentin.
- Goodness gracious, great balls of fire: cremation practices in Lan Xang Vientiane. Stacey Ward (University of Otago), Nancy Tayles, Thongsa Sayavongkhamdy, Viengkeo Souksavatdy, Naho Shimzu, Marion Ravenscroft.
- Dental health in prehistoric Cambodia. Jennifer Newton (James Cook University), Kate Domett, Dougald O'Reilly and Louise Shewan.
- The Neolithic demographic transition and oral health: a case from An Son Vietnam. Anna Willis and Marc Oxenham.
- Attitudes to ancestors and human biology in the past. Nancy Tayles (University of Otago), Hallie Buckley.
- A preliminary study on the status of health from late pre-colonial to early colonial period in the Philippines. Sigrid Labidon (University of Otago), Victor Paz.
- Diachronic changes in human health and adaptation in prehistoric Southeast Asia. Clark, A.L. (University of Otago), Tayles, N., and Halcrow, S.E.

Population sexual dimorphism is a useful measure of human adaptation to the environment. The general sexual dimorphism model posits that males are more sensitive to environmental changes than females. It is expected that in adverse conditions males would not reach their genetic potential in size, resulting in low levels of sexual dimorphism. This paper examines the relationship between the level of sexual dimorphism in stature, nonspecific infection and linear enamel hypoplasia (LEH) as indicators of health over time in a large prehistoric sample ($n=190$) from Southeast Asia.

An adult sample from Ban Non Wat, Thailand (3750 to 2420 BP) is used to test the hypothesis that low levels of sexual dimorphism in stature are associated with poor health. Individuals were examined for bilateral diffuse periostitis, as a measure of nonspecific infection in adult life and LEH prevalence as a measure of childhood health.

There is a diachronic decline in the level of sexual dimorphism in stature as a result of statistically significant increases in female stature, rather than a reduction in male stature as suggested by the model. For both sexes, the prevalence of LEH decreased significantly, suggesting improvement in childhood health over time. Nonspecific infection remains constant in females over time but there was a statistically significant increase in males. This paper provides evidence that the level of sexual dimorphism in stature does not directly correspond with indicators of either adult or childhood health. These results do not completely fit the expected pattern of the sexual dimorphism model.

- Frequency of LHPC in a sample of children from Man Bac, Vietnam. Amy McDonnell (ANU)
- Osteobiographies of Cambodian skeletal remains hopes to reveal new aspects of prehistoric life: a proposed study. Samantha Rowbotham (ANU)
- Surviving disability in Neolithic Vietnam: anatomy of a case of care. Lorna Tilley (ANU) and Marc Oxenham
- A new method for determining age in juvenile remains in SE Asia. Lindsay Watson
- Was *Homo floresiensis* an island dwarf form of *Homo erectus*? Debbie Argue.
- Cold case: origins of Polynesian body morphology. Peter Wilberfoss.
- Thai and other affinities of Neolithic South-Central Thailand crania. David Bulbeck.

• ***Australian Archaeological Association (AAA)***

This annual conference was held in Toowoomba in 2011, hosted by University of Southern Queensland. <http://www.usq.edu.au/aaa-conference>

One presentation of interest to readers:

- Stature comparison of prehistoric people at Bellan-bandi Palassa and Sigiriya-Potana in Sri Lanka. ¹Nelum Kanthilatha, ¹Boyd, W. E. & ²Chandimal, K. M. ¹School of Environmental Science & Management, Southern Cross University, Australia. ²Gampaha Wickramarachchi Ayurveda Institute, University of Kelaniya, Sri Lanka.

Reconstruction of stature from skeletal remains plays an important part of forensic anthropological analysis. Human stature is a quantitative trait that can vary among population and in different eras. The aim of this study was to reconstruct and compare the stature of two prehistoric populations in Sri Lanka inferred from measurements of fragmented long bones of skeletal remains excavated at Bellan-bandi Palassa and Sigiriya Potana. The archaeological deposits at Bellan-bandi Palassa are dated (AMS C14) at $10,086 \pm 142$ years BP, while the Sigiriya Potana cave deposits are dated at around 6000 BP (calibrated age ranges (one sigma): 3913 – 3727 BC (UA 5685) and 3913 – 3709 BC (UA 5686)). The stature of the extinct individuals was estimated using the regression formulae described by Trotter & Gleser (1952) for complete long bones and Krogman (1962) for fragmented long bones. The mean stature at Bellan-bandi Palassa was 140.05 ± 4.21 cm, and at Sigiriya Potana was 172.93 ± 0.35 cm. The significant difference in stature between the individuals at Bellan-bandi Palassa and Sigiriya Potana may be due to the environmental influence or evolutionary trend. Further studies need to be conducted on other prehistoric populations in Sri Lanka represented by human skeletal remains at sites such as Fa-Hien Lena (37,000 BP), Batadomba Lena (31,000 BP), Beli Lena (13,210 BP), Pallemalala (4500 BP), Ravana Alla (4750 BP) and Miniathiliya (not dated yet) to identify the environmental influence or possible trends.

Acknowledgement

We acknowledge to Prof. Surangi Yasawardene, Prof. Gamini Adikari, Dr. Siran U. Deraniyagala and to the Director of the National Museum in Sri Lanka.

If anyone would like a pdf of the poster please contact Nelum Kanthilatha at n.kanthilatha.10@scu.edu.au

• *Metric and Nonmetric traits and Biological Distance Workshop*

Michael Pietrusewsky presented a three-day workshop entitled, “Metric and Nonmetric traits and Biological Distance” to graduate students and faculty in Biological Anthropology, Department of Anatomy and Structural Biology, University of Otago, Dunedin, February 14-16, 2012.

• *Proceedings of the 4th Otago International Health Research Network*

Clark, A.L., Tayles, N., and Halcrow, S.E. (2011) Are men really the weaker sex? A look at sex differences in health in prehistoric Southeast Asia. *Proceedings of the 4th Otago International Health Research Network*, Dunedin, New Zealand (7th-8th November 2011).

A weaker male immune system is a topical issue for all investigations of health. Experimental evidence using mice suggests that females are hormonally buffered against fluctuations in environmental conditions during growth and development (Scotland *et al.*, 2011). It is expected that males would not reach their genetic potential for body size in a stressful or unfavourable environment.

Evaluating sex differences in past population health over time can help address questions that for ethical reasons cannot be experimentally examined in modern humans. This paper tests the female genetic buffering model using a prehistoric Thai adult skeletal sample ($n=190$) (3750-2420 B.P.) by comparing sex differences in accepted measures of health in early childhood (stature and linear enamel hypoplasia - LEH) and adult life (nonspecific infection).

Male stature remains constant over time, whereas female stature increases ($P<0.001$). Prevalence of LEH is greater for females than males ($P<0.05$), but improves with time for both sexes ($P<0.05$). The prevalence of nonspecific infection is higher for males ($P<0.05$) and increases through time ($P<0.05$), whereas female prevalence remains constant. This paper asserts that evidence of childhood and adult health does not directly fit the expected female genetic buffering model. It is thought that cultural conditions in human populations may outweigh underlying genetic mechanisms.

• ***Annual Otago School of Medical Sciences and Genetics PhD Colloquium and Poster Evening***

Clark, A.L, Halcrow, S.E and Tayles, N (2011) *The Price of Rice: health during the intensification of agriculture in Southeast Asia*. Annual Otago School of Medical Sciences and Genetics PhD Colloquium and Poster Evening, Dunedin, New Zealand (29th August 2011) * recognition of excellence award* and the Division of Health Sciences Research Forum, Dunedin, New Zealand (17 – 18th October 2011) * First Place*

Understanding what happened in the past can contribute to understanding present-day issues. Overcrowding and poor nutrition are believed to originate from the intensification of agriculture in prehistory. Little is known about the human biological responses and impacts on prehistoric health associated with rice based subsistence strategies compared with other modes of agriculture.

This study aims to investigate patterns of health and stress during the intensification of rice agriculture in prehistoric Southeast Asia. The hypothesis that levels of stress and poor health do not increase significantly is tested using a prehistoric Thai population (1750-420 B.C.). This site provides the largest skeletal sample in Southeast Asia spanning the period when rice agriculture intensified.

Results demonstrate a statistically significant increase in stature, and no significant change in LEH prevalence over time. This evidence supports theories that the maintenance of a broad-spectrum subsistence base with agricultural intensification helped maintain population health in prehistoric Southeast Asia.

UPCOMING CONFERENCES AND EVENTS

• ***14th International Conference of the European Association of Southeast Asian Archaeologists***

The EurASEAA14 conference will be held in Dublin this year. The conference will include a session on bioarchaeology organized by Damien Huffer (see below). The call for papers is open until the end of May.

<http://www.ucd.ie/archaeology/euraseaa14/>

<http://www.ucd.ie/archaeology/euraseaa14/sessions.html#Living>

- *Living and dying in prehistoric Southeast Asia: regional advances in human bioarchaeological science*

Organiser: Damien Huffer (Australian National University)

Contact: damien.huffer@gmail.com

This session will present new research in any subarea of human osteology and bioarchaeology in Southeast Asia. It is especially appropriate for new research into palaeohealth, trauma, isotopic evidence for individual or community level variation in diet and/or residency, activity and mobility patterns, or biomortuary approaches to social structure. Focusing on either prehistoric (Palaeolithic to Metal Age) or historic period populations, participants can discuss their latest research in these areas. Reports of new discoveries or the preliminary results of ongoing analyses are also welcome. In keeping with the theme of Science, Archaeology and Heritage, discussion of local efforts to preserve skeletal collections or conduct public outreach pertaining to the importance of intact cemetery sites for understanding prehistoric daily life would also be welcome.

• ***Australasian Society of Human Biology***

This year's ASHB conference is to be held at the Grand Hotel in Vanuatu from the 2nd to the 5th December, 2012. The conference flyer is included at the end of this newsletter. If you would like to be

put on the mailing list for further information about this meeting, please email the Society secretary Kate Domett kate.domett@jcu.edu.au

- ***Australian Archaeological Association (AAA)***

This year the AAA will be held in Wollongong, NSW, Australia from the 9th to the 13th December, 2012. Details for interested participants can be found at

<http://conference.australianarchaeology.com.au/>

This year a Bioarchaeology session is being convened.

Session title: "The Science of Human Remains"

Abstract: This session will present the latest research involving the excavation and analysis of human remains, including palaeopathology, within both a national and international context."

Please contact Georgia Roberts if you are interested in presenting: georgia.l.roberts@gmail.com

- ***Annual Meeting of the Paleopathology Association***

The European Paleopathology meeting will be held this year in Lille, France from the 27-29 August.

<http://www.ppalille2012.com/>

- ***8th International Conference on Rapa Nui and the Pacific***

July 8-13, 2012, Santa Rosa, CA.

One abstract to be presented includes:

- Bioarchaeology of the Mariana Islands: Prehistoric Chamorro Health and Lifestyle. Michael Pietruszewsky¹, Michele Toomay Douglas¹, Marilyn Swift², Randy Harper², Michael A. Felming². ¹Department of Anthropology, University of Hawaii at Manoa, ²Swift and Harper Archaeological Resource Consulting, Saipan

Previous investigations of health and disease in the Mariana Islands suggested that the prehistoric Chamorro of the smaller islands (Rota, Tinian, and Saipan) experienced higher frequencies of indicators of stress than those living on Guam. Possible reasons for these differences included differences in environment and/or resource availability and the greater impact of natural disasters on smaller islands.

Recent archaeological excavations of additional human skeletons from Tinian and Saipan provide an opportunity to expand these interisland studies of the health and lifestyle of prehistoric Chamorro when compared to skeletons from Guam. The indicators of health investigated include cribra orbitalia (CO), linear enamel hypoplasia (LEH), stature, trauma, infection, and dental disease (AMTL, caries, abscessing, alveolar resorption, calculus, and attrition).

Comparisons between Tinian and Saipan Islands reveal few differences. When the skeletons from Tinian and Saipan are compared to those from Guam, significantly higher frequencies of several indicators suggest more childhood stress and oral-dental disease in the Guam skeletal series. In a majority of indicators, no significant differences were found for the skeletons from any of the Mariana Islands. Unexpectedly, these results suggest that the prehistoric inhabitants of Tinian were subjected to lower stress levels than those living on the larger islands of Saipan and Guam. Cultural habits such as chewing *Areca* (betel) nut and other environmental and cultural differences are examined to explain these differences.

This research was funded by US Capital Improvement Funds administered under the CNMI and federal governments and the CNMI Department of Public Works and the US Federal Highways Administration.

- ***Forensic Science and Anthropology Field School***

The Department of Anthropology at The Ohio State University is conducting its 5th annual [Forensic Science & Anthropology Field School](#) from June 18th to July 13th in Columbus, OH. It is Co-Directed by Adam Kolatorowicz and Dr. Sam Stout. Students participate in the resolution of a mock medicolegal death investigation from crime scene discovery to testimony in court as an expert witness. Participants receive training from legal and forensic science professionals from multiple disciplines, with an emphasis on osteology and archeology. Students may apply at www.pastfoundation.org and

direct their questions to fieldschools@pastfoundation.org. Please see the attached flyer for more information.

Graduate Student Projects

HONOURS PROJECTS

Those underway...

- Danielle Dyer, University of Otago, Dunedin, New Zealand

My dissertation topic investigates whether or not there is a relationship between biological sex and grave wealth in the subadult individuals from Ban Non Wat, NE Thailand.

Supervisor: Siân Halcrow

MASTERS PROJECTS

Those underway...

- Flynn Fletcher-Dobson, University of Otago, Dunedin, New Zealand

Health and Social Change in Prehistoric Southeast Asia: An analysis of the infants and children from the site of Ban Non Wat.

The aim of this thesis is to assess the relationship between mortuary rites and health of infant and child remains over time. The site of Ban Non Wat has a skeletal sample that spans over than 2,000 years, coincident with the intensification of agriculture and technological development. This thesis will assess whether or not there was a change in health and social role of infants and children during this time of agricultural intensification.

Supervisor: Siân Halcrow

- Sigrid Labidon, University of Otago, Dunedin, New Zealand

Sigrid's research explores the health status of people from the Philippines during the late pre-colonial to the early colonial period. She has examined several skeletal samples from the Philippines dated from a thousand years ago to the late 17th century for any evidence of disease and poor health. Initial results have revealed that the samples from the colonial period exhibited more skeletal lesions than those from the pre-colonial period. These results indicate that there is a difference in the status of health during the transition from the pre-colonial to the colonial period in the Philippines, though further research is needed to confirm these results.

Supervisor: Hallie Buckley

- Jennifer Menzies, University of Sydney

Estimation of the Post-mortem Interval for Skeletonized Human Remains in an Australian Cool Climate Environment: Belanglo State Forest and Macropus giganteus in a Representative Case Study.

Master of Philosophy in Medicine

Supervisor: Denise Donlon

Those recently completed...

- Anna Gosling, University of Otago, Dunedin, New Zealand 2011

Past, Present and Future: Investigations into the history and possible causes of genetic predisposition to metabolic diseases in Pacific populations

Many indigenous Pacific populations have been observed to have a high prevalence of Type 2 Diabetes and Gout. While lifestyle factors are likely to contribute, there is evidence to suggest that there is a hereditary contribution to these diseases. A number of genetic loci which confer risk have been identified – notably, polymorphisms in the genes SLC2A9 (rs16890979, rs5028843 and rs11942223) and ABCG2 (rs2231143) have been found to have statistically significant associations with Gout in Pacific Island and Maori populations in New Zealand.

Gout has been found to leave a bony signature in sufferers of the disease. Such lesions have been found in archaeological human remains from a number of Pacific Islands. The development of ancient DNA technologies provides a unique opportunity to explore the antiquity of genetic variants which have been found to contribute to gout in modern populations. Thus, this thesis aims to explore the feasibility of using ancient DNA to investigate genetic diseases in the past, and whether it can be used to determine the presence of polymorphisms predisposing to gout in these past populations. Samples excavated from archaeological sites at Wairau Bar, New Zealand and Atafu, Tokelau were used for this task.

Consideration of human history in the Pacific, especially past population movements and entanglements, as well as selective pressures such as the introduction of diseases and adverse environmental conditions, contribute to understanding how these genetic variants may have become conflated in Pacific populations.

Supervisor: Lisa Matisoo-Smith

- Stacey Ward, University of Otago, Dunedin, New Zealand 2011

Burning Issues: An Investigation into the Cremation Practices Used in the Historic Lan Xang Period of the Lao People's Democratic Republic.

Bone fragments remaining after cremation can be used to provide information on the cremation practices of ancient cultures. This is possible as the study of bone colours can indicate what type of fire was used for the cremation and the position of the deceased during the cremation procedure (Symes *et al.* 2008). The type and depth of heat fractures are linked to the amount of flesh remaining on a body at the time of cremation, and therefore can reveal how long after death the cremation occurred (Whyte 2001).

In this way, cremation practices have been examined globally, but there is a dearth of information on past cremation methods in Southeast Asia. With the discovery of archaeological human remains in Vientiane in the Lao People's Democratic Republic in 2006 - 2007, an opportunity arose to investigate the cremation practices used in the Lan Xang period of Lao history (1353 – c. 1695 CE) (Evans 2002). The human remains, constituting a total of 25 people, consisted of individuals that had been cremated and interred in jars, cremated and scattered, or buried without cremation. Although this was a small sample, it provided a rare opportunity to contribute to the limited knowledge on cremation practices in the Lan Xang Kingdom.

This thesis aimed to contribute to the clarification of the cremation process used during the Lan Xang period, to identify variations within this process based on age, sex, pathology, burial weight, burial goods, burial jars and geographic location, and to clarify the issue of the archaeological dating of the inhumation burial BHB01.

Results showed that Lan Xang people were often cremated after their bodies had decomposed for a short time. Patterns of which skeletal elements were represented suggested individuals were cremated

in a supine position, and cremation temperatures, which ranged from 485 – 940°C, were consistent with cremation on a wooden pyre. Skeletal temperature patterns suggested the pyre was ignited around its edges.

Small sample size and poor representation of the remains made the identification of variation within the sample difficult. However, it appeared that age and type of death, as indicated by skeletal pathology, were most likely to have caused the variations observed in the Vientiane sample. Age was a main variation because Lan Xang children were cremated when modern children are not. It is also possible that pathology, and therefore the type of death, explains why some cremation burials included burial items or were buried in different jar types to their contemporaries.

Analysis of the inhumation burial BHB01's burial position, burial goods and burial depth suggested an archaeological date of the Iron Age (420 BCE – 500 CE) (Higham and Higham 2009), but radiocarbon dating was suggested in order to clarify this issue.

It was concluded that Lan Xang cremation practices were similar to modern Thai practices, but were influenced by age at death and type of death. Despite the inherent flaws identified in the methodology used for analysing cremation burials, this thesis shows that cremation burials can nevertheless provide valuable information on a culture.

Supervisor: Nancy Tayles

DOCTORAL PROJECTS

Those underway...

- Stephanie Shkrum, University of Otago, Dunedin, New Zealand

The aim of this research is to investigate the relationship between the development of intensive rice agriculture and oral health at Ban Non Wat, a prehistoric settlement in the Mun River Valley, Northeast Thailand. Specifically, this project has two principal objectives: (1) to examine the relationship between oral health and the intensification of agriculture (most notably the intensification of rice production) over time; and, (2) to examine sex differences in oral disease frequencies and to compare these rates over time. The site of Ban Non Wat has a long cultural sequence, continually occupied from the Neolithic Period through the Iron Age (1750 BC to 400 AD), a period during which the community grew from a small group of inhabitants into a socially complex village. Thus, this sample permits a diachronic perspective within a single settlement. The study combines bioarchaeological and clinical protocols for assessing oral health, including both macroscopic and radiographic analyses of multiple oral health indicators. It is anticipated that this synthesis of research methods will provide a precise representation of oral health distribution at Ban Non Wat, which will contribute to existing evidence of oral health experience in prehistoric Northeast Thailand and the Mun River Valley in particular. It is anticipated that all data collection, including radiographic analysis, will be complete by July 2012.

Supervisors: Nancy Tayles and Siân Halcrow

- Angela Clark, University of Otago, Dunedin, New Zealand

Sexual dimorphism and health in adult skeletal remains from Ban Non Wat, Thailand, during the adoption and development of agriculture in late prehistoric Southeast Asia

Angela is currently in the final stages of working on her PhD thesis research, with the central aim to characterise the relationship between the level of sexual dimorphism in body size and health status during the transitional periods to intensified rice agriculture for the Ban Non Wat sample.

At the population level the quality of life is a reflection of the ability of a community to exploit and adapt to the surrounding environment in which they lived. To date, there is insufficient data concerning diachronic changes in health in one specific population over a long chronology. Due to low sample sizes, most studies of Southeast Asian prehistory have concentrated on a comparison between different communities. This thesis provides an opportunity to assess the health status through time in a single geographical area, and provide information on the general quality of life and biocultural context of the prehistoric community of Ban Non Wat. This research will assess possible changes in the level of sexual dimorphism in stature and other metric measurements over time. In addition, health in early childhood is measured by the prevalence of linear enamel hypoplasia and adult health is assessed by the presence of subperiosteal new bone formation (periostitis) on the long bones. This PhD research will also contribute information on the extent to which body morphology varies between and within the sexes in prehistoric Southeast Asian adult individuals.

Supervisors: Associate Professor Nancy Tayles and Dr Siân Halcrow



Figure: Angela Clark in the field recording linear enamel hypoplasia for the Ban Non Wat skeletal assemblage for her PhD research at the University of Otago.

Those completed...

- Sarah L. Croker, Discipline of Anatomy and Histology, Sydney Medical School, The University of Sydney. Awarded May 2011

Comparative cortical bone thickness in human and non-human mammal long bones: biomechanical and forensic perspectives.

The determination of the human or non-human origin of skeletal material can be particularly difficult if the bone is fragmented. It has been suggested that differences in the thickness of the cortical bone between human and non-human mammal long bones may be used to distinguish them, though little clear data exist. The aim of this thesis was to determine the extent of such difference, and whether it could be used to identify fragments of bone shafts.

Potential differences in cortical bone thickness were investigated by comparing adult human limb bones (humerus, radius, femur and tibia) with those of kangaroos, sheep, pigs, large dogs and cattle. Each bone was radiographed in two projections perpendicular to each other, allowing measurement of the medial, lateral, anterior and posterior cortices and the shaft diameters in each projection at five sites located down the length of the shaft. A qualitative assessment of comparative radiographic differences was made; and corrections for radiographic magnification and tests of observer error ensured the validity of the study data.

Cortical bone thickness, shaft diameter, and an index of relative cortical thickness to shaft diameter were compared across all groups. Tests between humans and each non-human group showed significant differences in several cases, though this depended on which part of the shaft, skeletal

element, particular non-human mammal, and sex of the human sample was being compared. Previous research stating an overall difference, especially that non-human bones were relatively thicker, was not supported.

Discriminant function analysis was used to show whether distinction between human and non-human shaft fragments was possible using the combination of shaft diameter and cortical bone thickness measurements from a single measurement site. One analysis compared all skeletal elements together, yielding a cross-validated rate of correct classification of 69.5%. Though this rate of classification is not high enough to serve as a standalone method, it does represent a simple, useful tool to provide quantitative support to other identification methods.

Expected patterns of greater cortical bone thickness in relation to greater loading of the long bones were not clearly apparent. It is perhaps too simplistic to expect just one factor to influence cortical bone thickness, or that just this feature can distinguish all human from non-human bone fragments. Nevertheless, the data in this thesis provide a valuable contribution to assist in solving the difficult problem of the identification of bone fragments.

Supervisor: Dr Denise Donlon

- Aimee Foster, University of Otago, Dunedin, New Zealand, 2011

Gendered Divisions of Labour in Southeast Asian and Pacific Island Prehistory

Within the theoretical framework of gender archaeology, this thesis aimed to provide new information about social organisation in Southeast Asian and Pacific Island prehistory. Archaeological skeletal material from five prehistoric sites in Southeast Asia and the Pacific Islands was analysed in order to investigate the division of labour between males and females, as well as its variation in relation to environment and subsistence. This thesis represents one of only a few studies that have investigated gender and labour division in the prehistory of both regions, and fewer still have analysed skeletal remains for such a purpose.

The skeletal samples included in this thesis represent a broad range of temporal and geographic contexts within Southeast Asia and the Pacific Islands. All skeletal samples were associated with a mixed subsistence base of food production and foraging; however, the level of reliance on these resources varied between the groups.

The primary objective of this thesis was to identify differences between males and females in the expression of activity-related skeletal modifications (specifically enthesal change and osteoarthritis) that might relate to a gendered division of labour. This was achieved via direct comparison and through the use of exploratory cluster analysis. Entheses were analysed in groups representing muscles or ligaments acting on particular joints; in this way enthesal change and joint disease could be compared in order to identify corresponding patterns of change. The results of these analyses were also clarified by the consideration of other factors (age and body size) known to influence the expression of activity-related change.

Associations observed between activity-related change, age and body size highlighted the multifactorial nature of enthesal change and osteoarthritis aetiologies; however, it was also observed that the effect of these variables was not consistent across enthesis groups or joints, or between skeletal samples. Sex was also identified as a variable that may influence the expression of activity-related change through inherent biological differences. These factors were acknowledged as caveats to the analysis of gendered divisions of labour.

Concurrent patterns of change between entheses and joints and corresponding results of direct sex comparisons and cluster analysis did, however, point to possible patterns of labour division in each sample. These patterns could be related to environment and subsistence but were also dependent on the cultural context. In the Southeast Asian samples different patterns of labour division were observed;

these were linked to the relative diversity of subsistence resources and the degree to which agriculture was established.

Despite exploitation of broad subsistence bases, the Pacific Island skeletal samples demonstrated only a few differences between males and females that could be linked to gendered labour divisions. These findings were at odds with ethnographic, historical and linguistic sources, which describe distinct roles for males and females in Pacific Island societies. Alternate explanations were provided for this phenomenon. The types of activity-related change analysed might not be sufficiently sensitive to provide a detailed picture of task differentiation, so while labour levels appear to have been similar, it is possible that males and females in these skeletal samples did carry out different activities. It was also argued that distinctions between males and females inferred from other sources of evidence may not be accurate reflections of actual behaviour, and that patterns of behaviour have been subject to change over time.

Supervisors: Hallie Buckley and Nancy Tayles

- Rona Ikehara-Quebral, PhD degree in Anthropology awarded 2010, University of Hawai‘i-Mānoa
e-mail: rikehara@iarii.org or rikehara_quebral@hotmail.com
An Assessment of Health in Early Historic (200 B.C. to A.D. 200) Inhabitants of Vat Komnou, Angkor Borei, Southern Cambodia: A Bioarchaeological Perspective

From the growing archaeological record of mainland Southeast Asia, it is evident that the period from 500 B.C. to A.D. 500 witnessed changes in settlement patterns, subsistence strategies, landscape use, metallurgical technology, mortuary patterns, preferred prestige goods, economic industries, and trade networks. Such a dynamic socio-politico-technical environment would have had an impact on the health of inhabitants of the region, affecting men and women differentially as they adapted to changing roles. This period is known as the Early Historic Period in the Mekong Delta and the Iron Age in the rest of mainland Southeast Asia. A biocultural stress model is used to examine an Early Historic (200 B.C. to A.D. 200) human skeletal sample from Vat Komnou, Angkor Borei, Cambodia, located in the Mekong Delta, relative to two hypotheses: 1) The inhabitants of Vat Komnou are generally healthy, and 2) There are sex differences in patterns of health at Vat Komnou.

Paleodemographic indicators suggest the Vat Komnou group was increasing in size, with a high fertility rate and a high childhood mortality rate. While the cause of early death is not known, those who did not succumb to childhood disease attained a fairly tall stature in adulthood, comparable to other ancient groups in the region, and much taller than modern inhabitants of Cambodia. Life expectancy at birth is 22.63 years with an estimated crude birth rate of 44 live births per 1000 people per year. Dental pathologies are consistent with a horticulture/mixed economy not overly reliant on agricultural foods. Filing of the anterior teeth, observed in four individuals, may have negatively affected oral-dental health. Sex differences in oral-dental health, indicators of anemia, and degenerative disease suggest males and females had distinct labor roles and a differential access to foods. The adult sex ratio at this site is greatly skewed towards males (48:23), an imbalance that can be attributed to sampling error, differential mortuary practices, an out-migration of adult females, or an influx of young adult males. Low rates of dental disease, linear enamel hypoplasia, trauma, and infectious disease suggest this was a healthy group of people.

Dissertation Advisor: Professor Michael Pietrusewsky



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Conference Location

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Conference Schedule

- 2nd December: A welcome reception in the evening.
- 3rd December: Conference sessions all day followed by the ASHB AGM.
- 4th December: Conference sessions in the morning followed by a Museum tour in the afternoon. The conference dinner will be held at the Iririki Island Resort, a short boat trip from Port Vila.
- 5th December: Conference sessions all day.

Post-conference Tour

There is the possibility of a post-conference tour to Roi Mata and Teouma on the 6th December. Please email your interest to hallie.buckley@anatomy.otago.ac.nz

Abstracts

Abstracts for posters and presentations will be called for over the coming weeks. Abstracts will be due in September.



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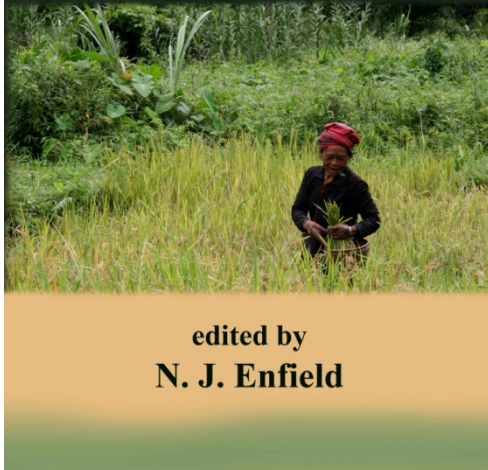
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DYNAMICS OF HUMAN DIVERSITY the case of mainland Southeast Asia



edited by
N. J. Enfield

627 Dynamics of human diversity: the case of mainland Southeast Asia

edited by N. J. Enfield

Human diversity is the central problem of all the fields of anthropology. Our languages, our genetics, our material cultures, our social organization: these are woven together by the ancient processes of change and diversification that produce the rich diversity we see today. What are these processes and how do they work? Can we know what life was like 10,000 years ago, and how it came to be the way it is today?

Dynamics of human diversity looks at these questions with a focus on one of the most fascinating sites of human diversity worldwide: mainland Southeast Asia (MSEA). In this book, experts on MSEA from across the disciplines of anthropology—linguistics, social anthropology, human biology, genetics, archaeology—bring together the latest empirical, methodological, and theoretical advances. Special attention is paid to two case studies of human diversity in MSEA: the Aslian peoples of Peninsular Malaysia, and the origin and diversification of the Austroasiatic languages. These, along with other chapters, show how new techniques for data collection and analysis are radically transforming what we know—and can know—about the past, and about the dynamic processes of human diversification.

The chapters of this book raise challenges for some common assumptions about the dynamics of diversity, especially for the idea that the key event in MSEA was a wave of agricultural colonization by ‘demic diffusion’. New evidence and analysis reviewed here suggests alternatives. By a scenario of population continuity, early resident populations of MSEA played a more agentive role in the social diffusion of ideas, technology, language, genes and cultural practices. The issues are explored here from a range of disciplinary approaches and points of view.

N. J. Enfield is a senior staff scientist at the Max Planck Institute for Psycholinguistics, and Professor of Ethnolinguistics at Radboud University Nijmegen, the Netherlands. His extensive publications in linguistics and anthropology are based on long-term fieldwork in mainland Southeast Asia, especially Laos. Publications include *Linguistic Epidemiology: Semantics and grammar of language contact in mainland Southeast Asia* (2003, Routledge), ‘Areal Linguistics and Mainland Southeast Asia’ (*Annual Review of Anthropology* 2005), *A Grammar of Lao* (Mouton, 2007), and *Human Sociality at the Heart of Language* (Radboud University Nijmegen, 2010).

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