Welcome to the 11th 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. You can also be able to find copies of this and past newsletters at http://seapbioarchaeology.wordpress.com/ and http://eprints.jcu.edu.au/ and search for “Domett”.

News

GUAM

From: Cherie Walth
SWCA Environmental Consultants, Albuquerque, New Mexico, USA
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Subject: Brief Discussion of the Results from the Agana Bridge Project, Guam

The Agana Bridge project for the Department of Public Works, Guam, is located along Route 1 from the intersection of Route 4 eastward to the intersection of Route 8, and south along Route 8 for 120 m (394 feet). The study area has been extensively disturbed in historic to modern times, with WWII bombing, channelization of the Agana River, construction of Route 1/Route 8, and the installation of utilities along the roadway. Despite the extensive past disturbance that had impacted the cultural deposits in the area, the project area still retains undisturbed cultural deposits. Fieldwork commenced June 28, 2012, and ended on April 11, 2014. The nearly 2 years of fieldwork included monitoring of ground disturbance below the base course of the roadway, hand excavation of four control units, excavation of 19 non-burial features, and excavation of 65 field-identified human burials.

The San Antonio Village Site (66-01-0261) is in the project area, and this work has allowed us an opportunity to learn more about Guam’s prehistory and historic post-Contact periods. The radiocarbon dates from the site indicate

Finished Tridacna adzes with blade ends present. Photo by J.R. Amesbury.
occupation of the project area from the late Pre-Latte or early Latte period to modern day. This site represents up to 1,100 years of history. The earliest feature that was radiocarbon dated is Feature 9 (A.D. 777–981) and is in the eastern portion of the site. The next earliest is Burial 42 matrix (charcoal sample) and dated to A.D. 975–1149 in the early Latte period. This burial is also in the eastern portion of the site. The remaining radiocarbon dates span the site area and are from the late Latte (A.D. 1270–1389) to the post-Contact period (A.D. 1451–1818) with two that were indeterminate post-Contact to recent (A.D. 1653 to post 1949).

The artifacts recovered included shell, non-human faunal remains, traditional ceramics, stone tools, and a variety of historic materials. In total, 523 non-human bone fragments were recovered and analyzed with the majority from the historic period and representing species that were not indigenous to Guam. Additionally, 467 traditional ceramic sherds recovered from EUs, features, burials, and monitored areas were subjected to analysis. Shell artifacts included items of adornment (beads), fishing gear (fishhooks), shell adzes, other marine tools (*Lambis* finger polishing tool), and five shell buttons. Unworked shell was analyzed from EU 1, EU 2, and EU 4, for a total of 17,729 grams. In total, 33 lithic artifacts were recovered and analyzed. There were 768 historical artifacts recovered from general monitoring areas, archaeological EUs, and features that were analyzed. The collection includes primarily ceramics (48 percent), but also glass, metal, and plastic.

The majority of the work associated with the archaeological investigation for the San Antonio Village Site in the Agana Bridge project area was related to the discovery and excavation of the human remains. The mortuary analysis examined the patterns of the burials in terms of location within the site and with information on age, sex, orientation, placement, and grave goods for each burial. The human remains were primarily clustered in three areas in the project area. The clustering of burials is similar to the pattern seen with other sites on Guam that indicate burials in and around a structure. Given the radiocarbon dates of most of the burials and cluster areas dating in the early post-Contact period, the practice of burials placed under or near a structure may have continued through this time period. Kinship may be the primary factor for association within the burial clusters.

There were 65 field numbered burials, but a minimum number of individuals totaling 94. The burial sample has individuals in age categories from infancy to old age (estimated in this group as 60 years or older). Overall life expectancy (mean age at death) is 26.6 years. The sex distribution of the adults shows that males outnumber females (26 to 21) with 1.2 males to every one female. However, sex could not be estimated for 20 individuals (29.9 percent of the sample).

The San Antonio Village burial assemblage probably reflects normal population mortality. There was no evidence of death from warfare or post-Contact introduced diseases. The individuals in this assemblage were generally healthy, active people. There is some evidence of yaws, which is known to be endemic for the pre-Contact population. Anemia, represented by cribriform orbitalia, was noted in very low frequency for this group. There is low frequency of LEH that would suggest that childhood stress was not frequent or severe enough to impact the overall health of the individual. The occurrence of
osteoarthritis, although commonly found, is generally slight, with very low rates of moderate to severe expressions. The amount of physical stress was likely low. The people were active, but the activity was not overly strenuous. This suggests good overall health and nutrition for this group.

From: Kate Domett (with Marc Oxenham, Hallie Buckley and Anna Willis)
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Subject: Analysis of the skeletal remains from Con Co Ngua

In June 2014 and May 2015 a team of biological anthropologists met in Hanoi, Vietnam to collaboratively analyse the recent skeletal remains from Con Co Ngua. In collaboration with our Vietnamese Institute of Archaeology colleagues, primarily Hiep Trinh Hoang, Trương Hữu Nghĩa and Minh Tranh, Marc Oxenham, Hallie Buckley, Kate Domett and Anna Willis, along with Ainslee Kells and Lynley Wallis, worked for a total of six weeks on the 183 individuals from the 2014 excavation. When combined with the skeletal remains from the 1979-80 excavation, we now have over 250 individuals from this sedentary hunter-gatherer community preliminarily dated to approximately 6,500 BP. The team now have the task of analyzing this data – initial indications suggest a continued high rate of trauma as seen in the 1979-80 collection. It was also apparent that there were a number of individuals suffering from significant systemic disease; for which a detailed differential diagnosis is currently being prepared.
CAMBODIA

From: Kate Domett  
James Cook University, Townsville, Australia  
Email: kate.domett@jcu.edu.au  
Subject: Prei Khemng, analysis of an Iron Age cemetery in northwest Cambodia.

In January 2015, a small team travelled to Siem Reap to complete the analysis of the skeletal remains from the 2013 excavation of the pre-Angkorian (late Iron Age) site of Prei Khmeng. These remains were excavated as part of the Paddy to Pura research project funded by the Australian Research Council, led by Dougald O’Reilly and Louise Shewan in collaboration with the APSARA Authority.

A detailed analysis was conducted on 10 individuals (2 females, 4 males and 4 subadults). The skeletal remains varied greatly in their preservation and completeness. Of note is some possible perimortem trauma in two individuals. Lauren Whiteford is currently completing her Honours thesis at James Cook University on this collection, particularly focusing on the quality of life of these individuals at this important pre-state transition period.

Willing and able volunteers Lauren Whiteford, Bonnie Clark and Tanya Erofeev

MYANMAR

From: Anna Willis  
Australian National University, Canberra, Australia  
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Subject: Mission Archéologique Française au Myanmar - Excavation of Oakaie

Anna Willis, Aung Aung Kyaw and Thomas Oliver Pryce

In February 2015, the excavation of Oakaie was undertaken as part of the Mission Archéologique Française au Myanmar in a joint collaboration between the French National Centre for Scientific Research and the Mandalay Department of Archaeology of the Ministry of Culture. The project was directed by Oli Pryce and Aung Aung Kyaw. The field team included Camilla Colonna, Xavier
Peixoto, Aude Favereau, Louis Champion, Lucy Andia, Baptiste Pradier, Anna Willis, Tin Tin Win, Mar Mar Aye, Maymyat Mon, Kalayar Myat Myat Htwe and Oakaie villagers.

Oakaie is a modern village situated about 2km south of Nyaung’gan, a famous cemetery site attributed to the Bronze Age. Two areas were chosen for excavation, Oakaie 1, a cemetery site, first opened in 2014 and Oakaie 2 a habitation site approximately 1 km west of Oakaie 1. One approximately 15 x 9 m unit was opened at Oakaie 1, west of the 2014 excavation area. In addition to the 21 graves containing 28 burials identified in 2014, the 2015 season saw the exposure of twenty four grave cuts, representing twenty one single burials and three double burials with associated mortuary artefacts including pottery, beads and bivalve shells. Six survey units were opened at Oakaie 2. Among the evidence for residential use, four infant jar burials and one adult burial were found.

All the individuals at the site were primary, extended, supine interments. There were subadults of all age classes in the sample and a fairly even representation of young, middle and old males and females. There was a high degree of sexual dimorphism observed between the sexes. The older adults suffered from severe tooth wear and associated antemortem tooth loss, alveolar lesions and resorption.

The successful season at Oakaie has provided a lot of information which will be used to address the multidisciplinary research objectives of the mission to help understand the social, cultural, economic and political development of the people in the area and help contextualise these within the wider Southeast Asian region.
OAI12015S46, an old adult female buried with a small pottery vessel and a spindle whorl, disturbed by S47

OAI12015S28, a young adult female with two pots (centre), near two children S41 (top right) and S40a (bottom right)
From: Veena Mushrif-Tripathy  
Deccan College, Pune, India.  
Email: vmushrif@gmail.com  
Subject: Finding of Human skeletal remains from the excavation at Talagarh in Odisha, India  

Umakanta Mishra, Subrata Kumar Acharya, Soumya Ranjan Sahoo, Veena Mushrif-Tripathy*  

*The first three authors are lecturer, Reader and Research Scholar in the department of History, Ravenshaw University, Cuttack, India and the last author is Asst. Professor, Deccan College, Pune, India.  

Human skeletal remains in the eastern state of Odisha in India have recently been discovered in the late Mesolithic context from Deulga hill, Rehrakhol, Sambalpur (21° 08’ 08”; 2° 08’ 15” N; 84° 08’ 35-84’ 08’ 45” E (Walimbe et.al. 2001 99–107) and in the Chalcolithic context from Banga Harirajapur (20 08 33.82 85 43 37.42 E) in Khurda district. Skeletal remains at Deulga hill was that of a young adult of about 25 years of age and exhibited a great degree of gracility. Excavations at Banga Harirajpur in Jatni block of Khurda district have yielded two adult skeletons and a pot burial containing a child (Basa et al 2014). The human skeleton for the present study was found during the excavation of Talagarh in Kulailo Gram Panchayat, Athgarh Block, Cuttack district by the Department of History of Ravenshaw University, Cuttack, India during April and May 2015.  

Evidence of the beginning of food production in Odisha in the second millennium before the Christian era came first from Baidaypur (Kajale 1991: 155 – 189; Thapar 1978: 11-22). Kuchai, also in Mayurbhanj shows clear transition from Mesolithic hunting gathering to food production (Basa 1999: 9–31; Harvey et. al. 2006: 21-32). This site has been reported to have rice remains and also wild rice impressions in ceramics (Vishnu-Mittre 1976: 13-21). However, the spread of farming communities in the Chalcolithic phase was unknown until the excavations of Golabai Sasan in Khurda district by ASI in 1992 (Sinha 1992: 48-50). Since then numerous Chalcolithic sites, namely, Khameswarpalli (Behera 2000-01: 13 –34), Gopalpur (Kar 1998: 107-114; 2000: 368-91) Banga Harirajapur and Padanhuda in Khurda and Puri districts respectively (Behera 2013: 61 – 65) have been explored, and some of them have been excavated. The recent excavation of Talagarh was conducted with the objective of understanding the spread of material culture of farming communities during the Chalcolithic period in the Middle Mahanadi area as many chalcolithic settlements, namely Badamal, Hukudi and Khameswarpalli, have been discovered in the upper part of the Middle Mahanadi valley.  

Location  

Talagarh (20° 32’ 33” N;85° 41’ 50”) is located 37 kilometers west of Cuttack and almost at the same distance from the state capital, Bhubaneswar. An approach road from Khuntuni market on National Highway (NH)-42 goes to Talagarh village and the mound. Two mounds, named Deltihuda A and B are visible on the western side of the village. The twin mounds are situated along with the left bank of a perennial stream locally known as Sudei nala, which merges with another stream, known as Kantia nala, running south-west of the mound and the village and finally merges with river Mahanadi which flows south-south-east of the village approximately at a distance of three kilometres.
Geology of the locality

The village is geologically in the northern part of the Athagarh basin. The Athagarh Formation rests uncomfortably over Eastern Ghat granulites (Precambrian), with dips of 3º-10º to the S and SE (Pandya 1995), or on Permian rocks. It is mainly covered by rocks of the Upper Gondwana Group and intruded by a single known basaltic dyke (dolerite) near Sidheswar hill. The lowest exposed section consists of coarse, loose textured conglomerate and ferruginous sandstones, while light coloured clays and sandstones occur near the top. This top sequence is perhaps co-eval with Dubrajpur sandstones of the Rajmahal Basin (Goswami 2007). The Athgarh Formation consists of quartz arenite, sub-lithic arenite, lithic arenite and lithic that characteristically lack feldspars. Compositionally they vary from argillaceous to ferruginous. Other rock types include conglomerates, grits, carbonaceous shale, yellow shale, purple shale, white ash grey and brown coloured fire clays. Most of these are found as small lenticular bodies within the exposed sections of sandstones. Therefore, the stratigraphic succession of Athagarh basin varies from Precambrian charnockites, khondalities, quartzites, through the Lower cretaceous dolerite to the recent alluvium and laterite (Goswami, et. al. 2010: 7-14).

Excavated area

Deltihuda A is oval in shape and approximately 220x170 m in size. Villagers have used JCB machines to quarry and level Mound A on all sides exposing the sections in the base of the mound. Further soil removal in the western part of the Mound has exposed four layers. On the other hand, the mound named Deltihuda B, also oval in shape, is smaller in size. The twin mounds are separated from each other by a small depression measuring 32 meters in width.
Three trenches (DLT-1, 2 & 3) were taken up for excavation in Deltihuda A in order to understand the nature and sequence of cultures. A trench of 5x5 m (DLT-1) was taken up for excavation at the datum point in south-north direction seventeen meters south of the centre line of the Deltihuda A. Another trench-DLT-2 (3x2 m) was selected for spadework, which is located 51 m west of the DLT 1. Soil removal by villagers had exposed four layers of the deposit and therefore, part of the cultural deposits was already exposed on the eastern section at the time of the excavation of DLT-2. Similarly, earlier soil removal had exposed three layers and a baulk exposing the occipital part of the human skeleton, 18.60 m west of the DLT-2. A trench of 2x1.5 m (DLT-3) in a west-east alignment was taken up after the chance discovery of the skeleton.

Ceramic assemblage

The excavations of all three trenches, DLT-1, 2 & 3 during April and May 2015 have yielded ten layers of occupation belonging to the chalcolithic phase. The pottery, antiquities and other cultural assemblage are all associated with the Chalcolithic age. Chocolate and red burnished wares are the predominant type. Ceramic assemblage also includes black and red ware, dull red ware, tan red ware,
red slip ware and black polished ware, chocolate burnished ware and red burnished ware. Layers 8-10 in DLT 1 & 2 and layer 10 in DLT 3 have yielded cord impressed potteries. In shape and design, the modal ones are bowls and basins with and without carination. Other designs include tumbler, dish-on-stand, bowl on stand, perforated ware, globular pot, carinated globular pot, straight edged bowls, narrow necked jar, pitcher, miniature pottery, handi and storage jars, etc. The pottery is decorated with incised, appliqué, zigzag lines and hatching marks, chevron pattern, concentric curved lines, concentric horizontal bands on neck, thick band on the belly, honeycomb pattern line marks. Decorations of the pottery include red olive painting in the form line drawings on burnished ware. These paintings are post firing and executed in red olive. The pottery and antiquities assemblage, as well as the texture and colour of various layers in DLT-1, 2 and 3, show striking similarities. Layer 10 of DLT 3 in its southern section has yielded a pot burial. The pot containing the urn burial was tan in colour and cord impressed. Cord impressed – both body sherds and rim portion – have also been found from all three trenches. Cord impressed pottery is associated with the neolithic level at Chirand in Saran district (Verma 1970-71: 19-23), Taradih in Gaya district of Bihar (IAR 1984-5: 9), Lahuradwa in Sant Kabir Nagar district of UP (Tewari et. al. 2005-06), Koldihawas and from Chalcolithic sites of Khairdih in Balia district of UP.

![Fig. 3: Cord impressed Pot burial](image)

Cord impressed pottery has been found in Neolithic-Chalcolithic contexts from various sites of Odisha. Excavations at the site of Golbai Sasan (Lat. 20° 01’ N and Long. 83o 33’ E) in the district of Orissa during 1991-92 revealed handmade pottery with cord and reed impressions from the Neolithic period; however, some potsherds indicate use of show-wheel and turn table technique. The pots are mostly vases in dull red and grey ware (Sinha 1992-93: 48–50). Dash (2000: 217) mentions a pottery type of cord-marked tapering body with pointed base, high neck and grey and brown in colour. Kar (2000: 373) also records cord-marked designs of vertical, parallel and uneven nature in the red ware pottery at the site of Gopalpur (Lat. 20° 01’ 52” N and 85° 21’ 19” E). Sites in the Middle Mahanadi valley, such as Khameswaripali, Khajeriapali and Hikudi also yielded cord-impressed pottery, though in less amount (Behera 2000-01: 13-34). Recent explorations by the Dept of Ancient Indian History Culture and Archaeology, Utkal University have yielded cord impressed pottery from three sites namely, Padanhuda, in Khurda district of Odisha (Behera 2013). Excavations at the Chalcolithicsite of Banga Harirajpur in Jatani block have also yielded cord impressed pottery (Basa et. al. 2014).

**Antiquities**

Antiquities from the excavations include adzes in diorite and dolerite, a tubular shaped bead in banded agate, a tablet shaped bead in quartz, truncate having a pointed end in carnelian, drum shaped and an arecanut shaped beads in terracotta are found on the surface and carnelian beads along with the skeleton just below the right ribs.
Human Skeleton

Layer 4 of DLT-3 to the west of the mound yielded a male skeleton, while L- 0 of DLT-3 yielded an urn burial. As described above, the occipital portion and femur of the male skeleton were exposed in the baulk which formed due to soil removal with JCB machine by the villagers. The skeleton was aligned in the magnetic east-west direction with head towards the east and legs towards the west. The burial is disturbed and has a lot of post burial activities. A maxilla with few teeth was found on the left side of the body and a mandible on the right side. The right humerus was seen in between mandible. While excavating, thoracic vertebrae were found below the crania but interestingly ribs were in the anatomical position. No cervical vertebrae were found and lumbar vertebrae were disturbed. The position of the skeleton indicates that the person was lying on their back, most likely in the supine position, with both hands straight. Positioning of the legs is not possible as a portion is missing.

Fig. 4: skeleton in situ

A lot of root activities were encountered and bones were damaged due to penetration of them into the bones. Few rodent teeth and rib fragments were also found.

Some bones are sturdy but some are damaged and were difficult to excavate from the site. In situ long bone measurements were taken. The right radius is around 28 cm and the ulna is 29 cm. The left radius is 26 cm and ulna 27 cm.

Not many other observations were carried out as it was only partially preserved but the individual showed robust features. The lesser trochanter is very pronounced.

Age estimation: this is an adult person. All the joints are fused. No old age related pathologies were seen on the bones. Dental attrition also indicates the age around 25 to 30 years old at the time of death.

Sex determination: The individual is preserved with complete left side greater sciatic notch (grade 4) which confirms male sex. Nuchal crest is of grade 4 and mastoid process is also grade 4. All these features confirm that this individual was a male.

Stature estimation: was possible based on two bones, one left radius which is 26 cm, taken after lifting of the bone, and the right ulna is 29 cm, taken in the field. It has some errors but these are the only complete bones. After the calculations according to radius the stature is 177.29 ± 4.32 cm and ulna
181.35 ± 4.32 cm which makes an average of 179.32 cm (5.9 ft). Though stature estimation is done it should be read with caution.

References


Recent Publications


**Conference Details**

**PAPERS PRESENTED AT RECENT CONFERENCES**

• **2014 Australasian Society for Human Biology**
  Hosted by the University of Adelaide, Australia
  The abstracts are available here and are also published in *Homo: the Journal of Comparative Biology*.  

• **2015 42nd Annual Meeting of the Paleopathology Association**
  The abstracts are available here:  
  [http://www.paleopathology.org/Complete%20program%202015%20final.pdf](http://www.paleopathology.org/Complete%20program%202015%20final.pdf)
  The following may be of interest:
  MOBILITY, DIET, TRAUMA AND DISEASE IN PREHISTORIC FIJI.
  Christina Stantis, Sian Halcrow, Rebecca Kinaston, Michael Richards, and Hallie Buckley

• **2015 84th Annual Meeting of the American Association of Physical Anthropologists**
  The following may be of interest:
  - Exploring childhood diet of survivors and non-survivors in prehistoric Tonga (c. 500 -150 BP) using isotopic analyses.
    C. STANTIS, R.L. KINASTON, M.P. RICHARDS, H.R. BUCKLEY
  - Stature estimation from modern Southeast Asian skeletal remains: Placing the data in context.
    J.R. GOLIATH, M.C. STEWART, P. TUAMSUK
  - Modern human origins in Southeast Asia: behavioral perspectives.
    R. HOERMAN, R.A. BENITEZ, K. BURNS, C.J. BAE
  - Early modern humans and morphological variation in Southeast Asia: fossil evidence from Tam Pa Ling, Laos.
  - Correlations among morphoscopic traits in peoples of the Pacific
    MELODY D. RATLIF
  - A Baffling Convergence: Tooth Crown and Root Morphology in Europe and New Guinea
    G. RICHARD SCOTT and ROMAN SCHOMBERG
  - Carbon and oxygen isotope ratios discriminate coastal and inland tropical foragers
    MEAGAN M. VAKIENER, KIRK M. ENDICOTT, PHILLIP ENDICOTT and NATHANIEL J. DOMINY
Ancient DNA and Isotopic analyses of human skeletal remains from Chelechol ra Orrak, Republic of Palau
JESSICA H. STONE, JUSTIN TACKNEY, DENNIS H. O’ROURKE, JOHN KRIGBAUM, SCOTT M. FITZPATRICK and GREG C. NELSON

Skeletal diagnosis of multiple diseases in an European juvenile
STELLA IOANNOU, MACIEJ HENNEBERG, RENATA J. HENNEBERG and TIMOTHY ANSON.

New estimates for stature in the Roonka Flat skeletal sample using the Revised Fully Technique
ARTHUR C. DURBAND, ETHAN C. HILL and KERYN WALSHE

A world-wide survey of humeral robusticity and midshaft shape
OSBJORN M. PEARSON and VITALE S. SPARACELLO

Risk minimization and a late Holocene increase in mobility at Roonka Flat, South Australia: an analysis of lower limb diaphyseal shape
ETHAN C. HILL, ARTHUR C. DURBAND and KERYN WALSHE

Morphological variability of Pleistocene Australian Aboriginal crania: an influence of cultural or biological processes
TODD ENGLAND, MACIEJ HENNEBERG and DONALD PATE

A new calculation of the habitable land area of Sahulland during the Last Glacial Maximum and its implications for hominin population size
JOANNA R. GAUTNEY and TRENTON W. HOLLIDA

Variation in body and limb proportions between Early and Archaic Americans and the prehistoric Jomon of Japan
NORIKO SEGUCHI and CONRAD B. QUINTYN

Variation in regional diet and mandibular morphology in prehistoric Japanese hunter-gatherer-fishers.
K.C. HOOVER, F.L. WILLIAMS

Femur Subtrochanteric Shape and Ancestry Assessment in Modern Japanese and Thai Individuals.
S.D. TALLMAN

• Australian Archaeological Association (AAA) 2014
Cairns, Queensland, Australia
Nigel Chang and Kate Domett hosted a Southeast Asian archaeology session entitled “The Archaeology of Culture, Climate and Change: From Deep Prehistory to the Vietnam War in Tropical Southeast Asia” including the following presentation relevant to biological anthropology:

To Follow in Their Footsteps: An Examination of the Burial Identity of the Elderly from Non Nok Tha.
Ken Ross and Marc Oxenham

Abstract
Archaeologist examine age, based on skeletal age, as a key criterion to discuss individual identity and consider broader mortuary behaviour of populations in prehistory. Identity studies in archaeology have begun to recognise and demonstrate the significance of the elderly as a separate cohort for analysis. Archaeological research in Southeast Asia is year to engage with this broader movement to consider the potential for examining the elderly as a unique cohort within prehistory. This paper examines mortuary data from the mainland Southeast Asian site of Non Nok Tha to explore the identity of the elderly in this population. Mortuary evidence suggests that individuals who were ‘old’ (biologically r socially) at their time-of-death were afforded selective burial treatment based on the subject’s age and sex.

• European Association of Southeast Asian Archaeology 2015
Paris, France.
Kate Domett and Sian Halcrow hosted a bioarchaeology session entitled “Addressing regional and world-scale archaeological questions through human bioarchaeology in Southeast Asia”. The following lists the presentations. Abstracts can be found here:

A c. 7,500-5,500 BP pre-neolithic pottery using culture in Northern Southeast Asia: Con Co Ngua.
Marc Oxenham, Anna Willis, Hallie Buckley
Osteobiography of a male from the Da But site of Con co Ngua, Vietnam: skeletal pathology in the context of subsistence change.
Hallie Buckley, Marc Oxenham, Kate Domett, Hiep Trinh Hoang

A synthesis of bioarchaeological research in Cambodia: regional significance.
Kate Domett, Jennifer Newton, Dougald O'Reilly, Louise Shewan

Human bioarchaeology in Luang Prabang, Laos PDR in regional perspective: the people from the Phou Phaa Khao Rockskeleton and Tham An Mah
Sian Halcrow, Korakot Boonlop, Joyce White, Helen Lewis

The Bronze Age necropolis of Koh Ta Meas: who were the earliest inhabitants of the Angkor region?
Mélanie Frelat, Caroline Christelle Souday

Impacts of social changes on human biology: the Khao Wong Prachan Valley, Thailand.
Chin-hsin Liu

Life and death at Iron Age Phromthin Tai, Central Thailand
Daniel Case, Thanik Lertcharnrit, Scott Burnett

Human skeletons from Vuon Hong: Thang Long citadel in Hanoi, Vietnam
Thuy Nguyen, Minh Tran

Talking heads: artificial cranial modification in the Philippines
Rebecca Crozier

A multi-technique look at migration in Ban Non Wat, NE Thailand
Charlotte King, R. Alexander Bentley, Una Strand Víðarsdóttir, Nancy Tayles

Assessing population affinity using dental metric and non-metric traits at the Leran burial site, Rembang, Central Java
Sofwan Noerwidi

UPCOMING CONFERENCES AND EVENTS

Australasian Society of Human Biology 29th Annual Meeting 2015
This year, ASHB will be hosted by Queensland University of Technology (QUT) in Brisbane from the 1st to 4th of December. The conference flyer will be posted at http://school.anhb.uwa.edu.au/ashb/ or more details from Donna MacGregor donna.macgregor@qut.edu.au. This conference is well attended by biological anthropologists from around Australia and New Zealand.

Australian Archaeological Association (AAA) 2015
This year the AAA will be held in Fremantle, WA, Australia in December.

For the Love of Death
January 8-9th 2016, Archaeological Studies Program, University of Philippines
This two-day conference aims to create an opportunity for researchers to present and discuss their latest work on archaeological human remains assemblages from across Southeast Asia, the Pacific and beyond. It will be hosted by the Archaeology Studies Program, University of the Philippines - the first time a conference dedicated to human remains will be held in the Philippines. While the conference is focused on research in Southeast Asia, we welcome papers on topics from other geographical regions from which we may be able to draw parallels.
More details at the end of the newsletter and by contacting loveofdeath2016@gmail.com
• **Annual Meetings of the Paleopathology Association**
  Europe: Moscow, dates to be confirmed, 2016.
  North America: Atlanta, GA, USA April 11-12\textsuperscript{th}, 2016
  
  [http://www.paleopathology.org/meetings.html](http://www.paleopathology.org/meetings.html)

• **Annual Meeting of the American Association of Physical Anthropology**
  North America: Atlanta, GA, USA April 12-16\textsuperscript{th}, 2016
  
  [http://www.physanth.org/annual-meetings/85th-annual-meeting/](http://www.physanth.org/annual-meetings/85th-annual-meeting/)

**Graduate Student Projects**

**HONOURS PROJECTS**

Those underway...

- Lauren Whiteford
  College of Arts, Society and Education, James Cook University, Australia

  **Evidence for conflict in prehistoric Southeast Asia: A life of conflict or peace? Insight into the dead: An individualistic approach in interpreting the quality of life of a pre-Angkorian society in Cambodia.**
  Supervisors: A/Professor Kate Domett and Dr Nigel Chang

**MASTERS PROJECTS**

Those underway...

- Lucille Pedersen
  College of Medicine and Dentistry, James Cook University, Australia

  **Evidence for conflict in prehistoric Southeast Asia: A life of conflict or peace?**

  This thesis will conduct new bioarchaeology research on prehistoric Southeast Asian human skeletal remains (Neolithic to Iron Age) to examine the prevalence and patterning of traumatic injury combined with archaeological evidence for warfare such as weapons, military paraphernalia, iconography and fortification of settlements. This new data will be combined with existing studies to holistically test theories of internal conflict and regional warfare and the driving forces behind them. Attention will be focused on a broader regional bioarchaeological perspective as opposed to narrow localised studies to increase the understanding of past behaviours as well as the cultural and environmental stressors that lead to trauma and conflict in earlier societies.
  Supervisors: A/Prof Kate Domett and Drs Nigel Chang and Sian Halcrow.
DOCTORAL PROJECTS

Those underway…

- Sean Tallman stallman@vols.utk.edu
  Department of Anthropology, University of Tennessee

  **The Evaluation are Refinement of Nonmetric Sex and Ancestry Assessment Methods in Modern Japanese and Thai Individuals**

  Subsequent to deaths resulting from natural disasters, armed conflicts, and homicides, the identification of deceased is paramount and depends on the accuracy of the scientific methods employed in the biological profile. Accurate biological profile methods require that they be developed, validated, and refined on contemporaneous skeletal assemblages that share a genetic history with the deceased. However, most biological profile methods were developed in North America on individuals of African and European descent, and it is unlikely that such methods can generate accurate biological profiles for Asian individuals. Moreover, Native Americans historically served as biological proxies for Asians due to their shared genetic history, resulting in the assumption that Native Americans and Asians are skeletally homogenous and share nonmetric skeletal features, including a less sexually dimorphic skeleton compared to non-Asian groups and a unique suite of cranial traits that can be used to ascertain ancestry. As the population of Asian groups in the U.S. is increasing significantly, the continued reliance on methods developed from non-Asian populations is especially problematic in forensic contexts where Asian remains are likely to be recovered (i.e., large U.S. cities and mass disasters). The current study will statistically test and refine the methods used to visually assess nonmetric sex from cranial and postcranial remains, and establish nonmetric cranial trait frequencies for modern adults in documented anatomical collections in Japan (Chiba University; Jikei University) and Thailand (Chiang Mai University; Khon Kaen University). As sex is reliably determined from the presence or shape of traits on the skull, clavicle, humerus, and pelvis, these traits will be assigned an ordinal score based on their robust or gracile expression. The scores and documented sexes will be analyzed statistically to identify the traits that best indicate male or female, while testing the hypothesis that Asian populations exhibit reduced sexual dimorphism compared to non-Asian groups. Additionally, nonmetric cranial traits commonly used to identify Native Americans will be scored to test the hypothesis that Japanese and Thai individuals differ from Native Americans and each other in their trait expressions and frequencies. The continued refinement of nonmetric sex and ancestry assessment methods is of utmost importance in the current U.S. judicial climate, which is dictated by the **Daubert** ruling of 1993 and requires rigorous testing of scientific methods. Additionally, this research will contribute to bioarchaeological studies and forensic anthropology through the development of more quantifiable and replicable methods necessary to increase the accuracy of biological profiles for two understudied populations representing East and Southeast Asia.

  Funding for this research has been provided by the National Science Foundation (NSF) and the Japanese Society for the Promotion of Science's (JSPS) East Asia and Pacific Summer Institutes (EAPSI), and the National Institute of Justice (NIJ).
**Understanding a threshold of population-specificity using the Transition Analysis aging method for Asian skeletal samples**

While Bocquet-Appel and Masset bid “Farewell to Paleodemography” in 1982, biological anthropologists have rallied to meet the hefty challenges in the field over the past three decades. A better understanding of the underlying biology of aging and cemetery formation processes as well as new theoretical approaches to aging methods has propelled the field of paleodemography forward. Such efforts have been compiled and published in a seminal volume (Hoppa and Vaupel 2002) that establishes a general consensus of biological anthropologists on a better theoretical approach to age estimation (i.e. The Rostock Manifesto). Most notably, Boldsen and colleagues (2002) introduced Transition Analysis (henceforth, “TA”), as the first comprehensive solution to age estimation with the superior statistical and theoretical framework that provides more accurate and reliable age-at-death estimation without violating essential biological principles.

With paleodemography inhabiting a stronger theoretical framework, attention has shifted toward evaluating whether there can be a “one size fits all” standardized aging method applicable globally or if between-group variation is so great that specific methods must be developed for each population. Population-specific aging processes have been demonstrated for American Whites, Blacks and Mexicans (Katz and Suchey 1989), East Europeans (Komar 2003), Australians (Lottering et al. 2013) and Southeast Asians and South Africans (Schmitt et al. 2002). Yet, Konigsberg et al. (2008) argue that standardization of aging methods is possible. If this is true, what is the threshold of a population to whom a specific technique can be applied? Do all Asians across continents constitute a single population for whom a single method can be applied? Komar (2003), for instance, has shown that pubic symphysis methods developed on American Whites do not perform well when applied to East Europeans who are also considered “White.” So is the threshold of a “population” for aging persons continental, regional or local? The key to addressing this question lies in a holistic understanding of population history as well as systematic studies of population subgroups. In this respect, Asian groups provide an excellent study population because, in part, the population histories are well documented.

Tayles and Oxenham (2006: 2) eloquently explain that Asia is an ideal locale for “synthesising research on human biology to address the issues of human evolution, variation and biocultural development,” because it has a unique suite of characteristics not found elsewhere: a very long human settlement, geographic and climate diversity over time and space, and great antiquity of the current rice-based subsistence system. This data rich region further has a complex population migration and settlement history that has enriched our understanding of the initial peopling of the region (Pechenkina et al. 2013: XVII). The long history of paleontological and bioarchaeological studies Southeast (SE) and East (E) Asian regions have yielded several theories about SE and E Asians biodistance suggesting strong evidence of their close ancestor-descendant relationship. This provides us a sound rationale to use
Asian skeletal samples to systemically evaluate the assumption of biological uniformitarianism (Howells 1976) in the context of age estimation.

For these reasons, four fully-documented skeletal samples representing part of modern SE and E Asian populations (i.e. Thais and Japanese) were specifically chosen for this study to further our understanding in age progressive skeletal changes—that have been reported to be population-specific—and to simultaneously define a threshold of a population in the context of age estimation using the TA aging method as a tool to assess within- and between-individual variation as well as inter-population variation in aging rates and patterns. In summary, this project seeks to (1) successfully define a threshold of a population, (2) identify new (if there is any) skeletal traits unique to some of the Asian populations, (3) specify more reliable age indicators for these groups, and (4) adopt a methodological approach that better incorporates within-individual, between-individual, and inter-population variations in skeletal aging process. The ultimate goal of this study is to put in place the building blocks that are necessary to broaden the utility of TA method to developing a more inclusive age-at-death estimation method that can be reliably used for geographically and ancestrally diverse populations.

This project has been funded by Wenner-Gren Doctoral Dissertation Fieldwork Grant, Wenner-Gren Foundation, W. K. McClure Scholarship for the Study of World Affairs, Center for International Education, University of Tennessee, Knoxville (UTK), W. M. Bass Endowment, Forensic Anthropology Center (FAC), UTK, and W. Leitner Award, FAC, UTK.

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  **The Identity at Death of the Young and Old from the Neolithic, Bronze and Iron Ages on the Southeast Asian Mainland**

Archaeologists use age, specifically skeletal age, as a key factor to engage with, and explore, the potential socio-cultural, economic and philosophical-religious identity of subject’s in prehistoric settings. A deviation from the traditional androcentric prism of prehistory, influenced by a range of disciplines, has occurred in the recent past with the advent of research focussed on the role and identity of females, subadults and more recently the elderly. This mortuary research will explore behaviour towards the young and the old at death, by those living survivors, in the prehistory of the Southeast Asian mainland through the examination of mortuary data spanning the Neolithic (2000BCE-1500BCE) to the Iron Age (500BCE-500CE) from the sites of Khok Phanom Di, Ban Lum Khao, Ban Non Wat and Noen U-Loke.
Health, diet and migration prior to the establishment of the Angkorian civilisation of Southeast Asia

This project examines the health, diet and migratory patterns of prehistoric people of Southeast Asia prior to the establishment of the Angkorian Empire in the early 9th century. Until now, evidence suggests Southeast Asia did not follow the trend towards declining health experienced by the rest of the world during the rise of complex civilizations. The research sample included human skeletal remains from three prehistoric Southeast Asian sites. The remains selected from Ban Non Wat in northeastern Thailand spans the Neolithic to early Iron Age (~2500 – 500 BC) and includes new samples as well as previously published work. Also included is new data from two late Iron Age sites in northwestern Cambodia, Phum Snay (~500 BC – 500AD), and Phum Sophy (~AD 100 – 600). Previously published bioarchaeological work from other prehistoric sites encompassing the Neolithic to late Iron Age is used to identify general trends for Southeast Asia. This project hypothesized that the Neolithic to early Iron Age’s stable environment and minimal social changes would not have negatively impacted the health of communities through these time periods. In contrast, the environmental and social changes throughout the Iron Age would impact diet and migratory patterns, causing a general decline of health into the late Iron Age.

Health was examined at all sites through the analyses of childhood stressors including cribra orbitalia, linear enamel hypoplasia, and stature, along with adult dental health. Through carbon isotope ($\delta^{13}C$) analysis of the dental enamel this study was able to identify childhood diet at Ban Non Wat. Unfortunately, isotope analyses were not available for Phum Snay and Phum Sophy, therefore only dental health was used to identify aspects of diet at these sites. Migration was studied using strontium isotopes from dental enamel for Ban Non Wat. Phum Snay and Phum Sophy migratory patterns were determined from biological markers, such as dental modification. Through the examination of these three lines of evidence, the data for each site was examined independently to explain health, diet and migration, then combined with previously published work to identify general trends through Southeast Asian prehistory.

The evidence from the examination of health suggests the people of Ban Non Wat were generally healthy. The results across Southeast Asia demonstrate improvement of health into the early Iron Age, supporting previously published work. However, when compared to the broader context of the Iron Age in prehistoric Southeast Asia, both Phum Snay and Phum Sophy suggest a trend of declining dental health during the late Iron Age. In particular, it appears female health may have been more negatively impacted throughout the Iron Age, evident from increased stress and poorer dental health.

Analyses of $\delta^{13}C$ values at Ban Non Wat indicate a gradual change of diet composition during the Neolithic to early Iron Age with minor variation in the middle of the Bronze Age. This suggests a
change to a diet comprised mainly of C₃ foods, with minimal impact from C₄. Other nearby sites also display δ¹³C values indicative of a mainly C₃ diet, but were significantly different to Ban Non Wat based on overall contribution of C₃/C₄. These differences are suggestive of groups in this region living as independent units into the early Iron Age. Phum Snay and Phum Sophy dental pathology profiles suggest a diet with a greater reliance on agricultural foods, following a trend from other Iron Age sites within Southeast Asia.

Migratory indicators at Ban Non Wat suggest long-distance migration sharply declined or ceased in the late Bronze Age, but may have continued into the Iron Age through short distance routes. Social and biological patterns from Phum Snay and Phum Sophy suggest extensive movement and/or trade with many groups near and far during the late Iron Age.

This study finds that the stability of the environment and smaller population sizes allowed the inhabitants of prehistoric Southeast Asian communities to utilize local resources and live generally well into the Iron Age with improving health. However, throughout the Iron Age a decline of health, in particular for females, corresponded with changes to diet, increased fertility and settlement sizes, which may have been at least partially caused by the environmental changes. Increased settlement size and extensive exchange routes during the late Iron Age may have linked emerging new diseases and increased health problems. This research suggests Southeast Asia does follow a similar trend of declining health as a result of diet changes, migratory patterns and environmental changes as other complex societies around the world have shown, but these changes occurred at a much later time period in Southeast Asia - in the late Iron Age.

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**Health and Society in Southeast Asia: The Transition from the Late Bronze Age to Iron Age.**

Bioarchaeological studies incorporate components of bioanthropological and archaeological research. Alone each discipline presents valuable information, but when these disparate methods are used in combination to examine past societies, a holistic interpretation can result.

The purpose of this study is to develop a methodology that quantifies the overall health of individuals based on skeletal remains found in archaeological contexts. The Southeast Asian Health Index was inspired by the Western Hemisphere Health Index. The challenge in devising a health index for Southeast Asian skeletal remains from archaeological contexts is multifaceted. The index must be relevant at an individual level, easily reproduced by any user and include health attributes that are collected as standard from skeletal remains.

In this thesis, the Southeast Asian Health Index is developed and forms the basis of a series of bioarchaeological analyses. The index comprises the following attributes; age at death, dental health (alveolar bone health, caries and ante-mortem tooth loss), trauma, growth (enamel hypoplasia and long
bone length), degenerative joint disease, childhood cranial and orbital lesions, and other pathological conditions. The structure of the health index enables comparison of individual health attributes as well as overall community health.

As a way to test this index, the transition period from the Late Bronze Age to Early Iron Age in northeast Thailand was investigated using health and social indicators. The two sites examined were Noen U-Loke and Ban Non Wat. The health of individuals within each time period, Mid Bronze Age, Late Bronze Age, Early Iron Age, and Mid Iron Age, were compared with societal indicators, seen in burial treatment.

Five hypotheses were tested in this study based on the results of the Southeast Asian Health Index and individual burial treatments. Two hypotheses are based solely on the Southeast Asian Health Index.

Firstly, it is hypothesised that the health of the people of Ban Non Wat and Noen U-Loke improved from the Late Bronze Age to Iron Age. It was found that overall health improved through time, but with complexity. This complexity was evident in the testing of the second hypothesis. In addition, patterns regarding individual health attributes could be identified. For example, this included an improvement in male dental health over time, whereas female dental health remained static.

The second hypothesis stated that health differentiation could be seen between archaeological sites in the same region. The context of the settlement impacts the health of the village. In this study, the newly established village of Noen U-Loke, in the Early Iron Age, showed a distinct difference to the well established village of Ban Non Wat.

Based on relationships between the Southeast Asian Health Index and burial treatments, two further hypotheses were tested.

The third hypothesis asserts that there is a correlation between burial treatment and health. A number of correlations between health and burial treatment were identified. These suggest that females buried with ornaments had poorer health, as did males with animal bones. It is postulated that these burial goods may be medical aides or amulets for the afterlife.

The fourth hypothesis tests the assertion that a correlation between health and burial treatment reflects social identity. It was identified that when health data is used in combination with burial treatment data, social identity was more reasonably distinguished than by using burial goods alone. The combination of health data with burial treatment enabled additional context, which ultimately altered interpretations of social identity based solely on burial goods. In one case, the interpretation of occupation suggested by the burial goods was refuted by the health data.

The final and fifth hypothesis relates to burial treatment and tests if society became more stratified from Late Bronze Age to Iron Age. Based on the sample, no evidence of stratified society could be identified.

Overall it was found that the Southeast Asian Health Index provides a sound method of identifying relative health for individuals, groups and populations through time. Used in combination with archaeological contextual information it can provide multidisciplinary interpretations. The use of burial treatment data, rather than estimations of wealth to identify social identity, is distinctively different to previous studies. This study provides a unique bioarchaeological methodology, combining health and social status, to produce additional interpretations.

Supervisors: A/Prof Kate Domett and Dr Nigel Chang
Bioarchaeology
Interpreting Behavior from the Human Skeleton
Second edition
Clark Spencer Larsen
Ohio State University

Now including numerous full colour figures, this updated and revised edition of Larsen’s classic text provides a comprehensive overview of the fundamentals of bioarchaeology. Reflecting the enormous advances made in the field over the past twenty years, the author examines how this discipline has matured and evolved in fundamental ways. Jargon free and richly illustrated, the text is accompanied by copious case studies and references to underscore the central role that human remains play in the interpretation of life events and conditions of past and modern cultures. From the origins and spread of infectious disease to the consequences of decisions made by humans with regard to the kinds of foods produced, and their nutritional, health and behavioral outcomes. With local, regional, and global perspectives, this up-to-date text provides a solid foundation for all those working in the field.

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For the love of death
January 8-9th 2016
Archaeological Studies Program
loveofdeath2016@gmail.com
Call for Papers

For the Love of Death: Human Osteoarchaeology in Southeast Asia and the Pacific

This two-day conference aims to create an opportunity for researchers to present and discuss their latest work on archaeological human remains assemblages from across Southeast Asia, the Pacific and beyond. It will be hosted by the Archaeology Studies Program, University of the Philippines - the first time a conference dedicated to human remains will be held in the Philippines. While the conference is focused on research in Southeast Asia, we welcome papers on topics from other geographical regions from which we may be able to draw parallels.

Keynote Speaker: Dr. Marc Oxenham, School of Archaeology and Anthropology, Australia National University

Papers are invited for inclusion in the following sessions:

Seen But Now Heard: The Osteoarchaeology of Juveniles
This session will discuss the latest research on juvenile remains in the archaeological record. Topics may include, but are not limited to, palaeopathology, mortuary practices and taphonomy.

Before They Died
This session will focus on the osteological evidence for lived lives. A wide range of topics, from diet and nutrition, occupation and demography, to isotopes and DNA are invited.

Nasty, Brutish and Short? Violence, Trauma, Health and Disease
This session will consider the quality of life experienced by past populations. Therefore, papers will present new research on topics including the evidence for health, disease, age at death and violence.

The Dying Game
This session is concerned with the osteological evidence for mortuary practices.

All In! Open Session
Any other papers on human osteoarchaeology that do not seem to find a home in any of the above sessions will be assigned to this session. This may include papers on new analytical techniques, theoretical approaches or new excavations.

Abstract Submission
Abstracts of no more than 200 words for a 20 minute paper should be sent to loveofdeath2016@gmail.com by August 7th 2015. We welcome papers from academics, commercial archaeologists, and post-graduate students alike. Abstracts for poster presentations will also be accepted.

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