



NEW ZEALAND
ARCHAEOLOGICAL
ASSOCIATION



Australian
Archaeological
Association

TRANS-TASMAN DIALOGUES

CONFERENCE PROGRAMME



Tuesday 27th November - Saturday 1st December 2018

Contents

Contents

Table of Contents	3
Welcome	4
Conference Organising Committee	5
Sponsors.....	6
Auckland Information.....	7
Conference Information	8
Floor Plan	9
Instructions	10
Social Media	11-12
Meetings.....	13
Functions.....	14
Post Conference Field Trip	15
Awards and Prizes	16
Concurrent Session Abstracts.....	17-25
Detailed Program	26-38
Abstracts	39-122
Advertising	123-125
Notes.....	126-131

Welcome



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Welcome

Kia ora koutou, welcome to Auckland, Tamaki Makau Rau, the City of Sails, for the 2018 New Zealand Archaeological Association / Australian Archaeological Association combined conference, the first time we have joined forces this way. This represents a rare opportunity to compare notes and learn from each other, close neighbours bound together by a shared history but with very different archaeologies.

Our thanks to our hosts, Ngāti Whātua, tangata whenua of Tamaki, who will open the conference with a whakatau and close with a whakamutunga.

The conference theme is *Trans-Tasman Dialogues*. Despite some striking differences between the archaeological record of New Zealand and Australia, we share the same historical roots as well as some key goals and priorities: the desire to make archaeology an inclusive and collaborative practice between archaeologists, indigenous communities and other stakeholders, to raise public awareness about the richness of the human past in the region, to promote and foster cutting-edge research throughout Oceania and to lobby relevant authorities for the recognition and protection of cultural heritage. This joint conference is a unique opportunity for both organizations to create dialogue around some of these similarities, but also to highlight and contextualize differences, and to learn from what each organization does exceptionally well.

We are pleased to welcome archaeologists and heritage practitioners, academics, students and consultants, from New Zealand, Australia and further afield. The venue for this year's Conference is the Owen G. Glenn Building (OGGB) at the University of Auckland, with a gala dinner at the Grand Millennium Hotel. This year's post-conference field trips will be to either of two of the Hauraki Gulf islands: Rangitoto or Tiritiri Matangi, each with both archaeological and natural heritage attractions. We hope you enjoy our beautiful city.

Matthew Campbell

NZAA / AAA 2018 Convenor

Committee

Conference Organising Committee

Matthew Campbell

Conference Convenor
CFG Heritage

Alex Jorgensen

University of Auckland

Katharine Watson

NZAA President
University of Canterbury

Gerard O'Regan

University of Auckland

Aaron Fogel

AAA Treasurer
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Michael Slack

AAA President
Scarp Archaeology

Lara Lamb

AAA Vice President
University of Southern Queensland

Sponsors

Sponsors

The Conference Organising Committee acknowledges with gratitude the following companies and organisations that have provided sponsorship for this Conference.

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Australian Biodiversity
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SOUTHERN PACIFIC
ARCHAEOLOGICAL
RESEARCH
Department of Anthropology & Archaeology



Auckland info

The following information is provided as a guide to Auckland. If you have any queries, please visit the registration desk.

Getting around Auckland

Taxis and shuttles

If you require a taxi there are a host of companies to choose from. Some recommended companies are:

Auckland Co-op Taxis: 09 300 3000

Discount Taxis: 09 529 1000

Green Cabs: 0508 447 336

Airbus Shuttle: 09 366 6400

Buses

The InnerLink (green) bus connects Auckland city fringe suburbs with the central business district. There are also CityLink (red) buses that follow a route around the inner city. Buses run to all parts of the Auckland region from the Britomart Transport Centre, Downtown Auckland.

Trains

Trains run regularly to central, east, south and west Auckland suburbs from the Britomart rail station. <https://at.govt.nz/bus-train-ferry/>

Boat

If you would like to take a day trip to one of our wonderful islands, we recommend Fullers Group 0800Fullers.

Night on the town

Want to go out for a night on the town but unsure where to start? Here are a few options:

Britomart

Britomart is a vibrant shopping, entertainment and business precinct in the heart of downtown Auckland. Surrounded by beautiful heritage buildings, it's a neighbourhood of buzzing restaurants, cool bars, designer boutiques and quirky art spaces.

Viaduct Harbour

Hobson Wharf, Corner of Quay and Hobson Street

With over 20 bars and restaurants to choose from in one waterfront destination, Viaduct Harbour is a superb place to dine or relax and watch the world go by. On Friday and Saturday nights the bars and restaurants are filled with people looking for fun and excitement.

Karangahape Road

Immerse yourself in vintage shopping and the flavours and delights of local cafes, restaurants and ethnic eateries. Enjoy the lively nightlife and the contrast of respectable and risqué that is K Rd. www.kroad.com

Ponsonby Road

Ponsonby Road, Auckland's hippest strip, is easily accessible by the InnerLink bus and is home to over 100 of Auckland's top cafes, bars and restaurants. Take a stroll down the strip to check out the boutique shops, local fashion scene and some of the best coffee in Auckland.

Sky City

Corner of Victoria and Federal Streets. 5-star restaurants, bars, clubs, casinos and the iconic Sky Tower!

Conference info

Conference Information

Venue

The Conference will be held at the University of Auckland's city campus in the Business School Owen G Glenn Building (OGGB), 12 Grafton Road, Auckland.

Registration Desk Opening Times

Tuesday 27 November 5.30pm - 7.30pm (for those attending welcome function)

Wednesday 28 November 7.30am - 5.30pm

Thursday 29 November 8.00am - 5.30pm

Friday 30 November 8.00am - 5.30pm

Conference Opening

The first session of the Conference will commence at 8.30am on Wednesday 27 November in Theatre 098, located on Level 0 of Owen G Glenn Building.

Parallel Sessions

Parallel Sessions will be held in Theatre 098, OGGB3, OGGB4, OGGB5, Case Room 2 and Case Room 3. All rooms located on Level 0.

Conference Closing

The Conference will conclude with the Conference Dinner on Friday 30 November.

Workshops

Thursday 29 November, 1.40pm - 2.00pm

Publishing in Academic Journals Workshop OGGB5

Owen G Glenn Building

Friday 30 November, 1.40pm - 2.00pm

How to Promote your Work Workshop OGGB5

Owen G Glenn Building

Refreshments

Morning and afternoon teas and lunches are included in the Conference registration fee. All catering is served in the Foyer on Level 0.

Special Diets

If you have indicated a special dietary requirement on your registration form, please identify yourself to either the Registration Desk or the catering staff during the catering breaks and they will be pleased to assist.

Name badges

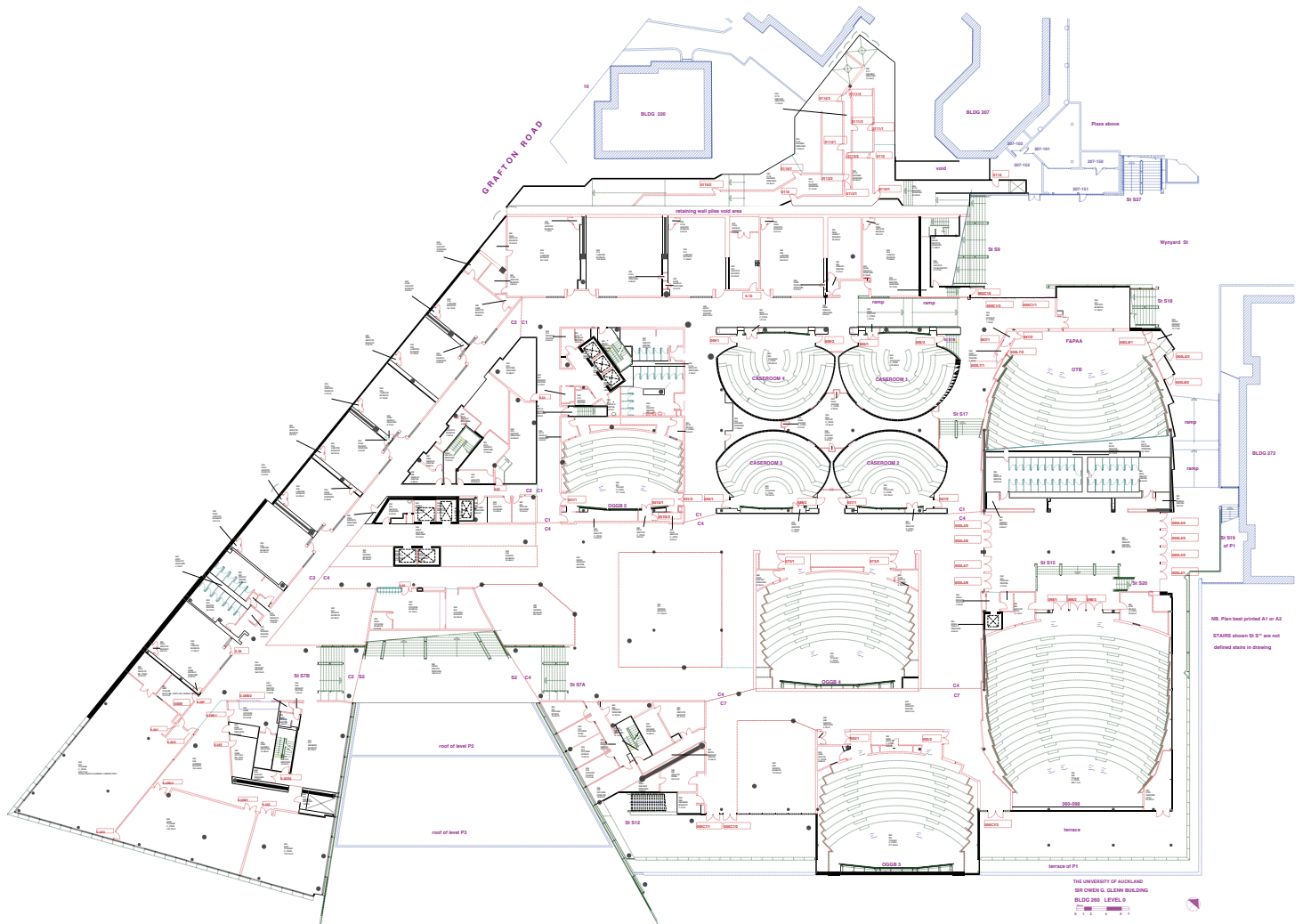
Delegates will be provided a name badge, which must be worn at all times within the Conference venue, particularly at catering breaks.

Satchels

Delegates will receive a Conference satchel upon registration, including materials submitted by sponsors and the Conference Programme.

Floor Plan

Venue Floor Plan - OGGB L0



Instructions

Instructions for Session Convenors

Each presentation timeslot is 20 minutes, including 5 minutes for discussion.

You will be provided with 5-minute and 1-minute cards for use during each presentation.

To facilitate movement between sessions and to ensure the program runs to schedule, please adhere strictly to the program as provided. If a presenter does not arrive for their slot, please do not move other presenters forward, but rather wait until scheduled time to begin the next presentation.

Instructions for Presenters

Each presentation timeslot is 20 minutes, including 5 minutes for discussion.

Please be in your session room 10 minutes early to assist all sessions to run on time. Your Session Convenor will brief you about the format of the session before the commencement of presentations.

If using a PowerPoint presentation, please bring your file on a USB to the room of your presentation during the break before your session, or 20 minutes before the start of the day's proceedings. Videos must be embedded in the PowerPoint, and also provided as a separate file on your USB. A volunteer will assist with uploading your presentation.

Instructions for Poster Presenters

Posters should be a maximum of ISO A0 size in portrait format and be printed on high quality paper (please try to avoid material posters).

Posters will be displayed from Wednesday 27 – Friday 30 November in designated area in the Foyer on Level 0.

Upon arrival at the Conference please check in at the Registration Desk where you will be provided with your poster number Velcro to hang your poster.

Posters are to be dismantled on Friday 30 November by 5:30pm, following the poster session. Dismantling of the posters is the responsibility of the presenter and no responsibility can be accepted by the organiser for collection or safekeeping of posters. Posters not collected by 10am on Saturday 1 December will be discarded.

Best Poster Awards will be presented at the Conference Dinner on Friday 30 November.

Social Media

Social Media Guide

Wi-Fi

Complementary Wi-Fi internet is available at the Conference venue for delegates. Check your name badge for login details.

Mobile phone/ recording devices

While we appreciate that you might want to use your phone during the Conference, as a courtesy to presenters and those around you, put it on silent and do not use the flash to take photos during sessions.

For Presenters

Individuals may wish to record or photograph your presentation and/or slides on personal devices. If you have sensitive material in your presentation that you do not want recorded or you simply do not wish to be recorded or photographed, please make an announcement to this effect at the beginning of your presentation; e.g. 'Please do not record or photograph this presentation'. (Contact AAA's Social Media Managers via Facebook or Twitter account or your Session Convenor if there is any violation of your wishes not to have your presentation recorded or made public online in any form.)

For Delegates

If you are planning to record or photograph presentations and/or slides, please be respectful if a presenter requests that you do not do so. Any recording or photographs should be for your personal use only and not for uploading to any social media or other online platforms without the presenter's express permission, which you must request personally and prior to publishing.

Facebook

NZAA and AAA are active on Facebook and we each have a dedicated event page for the Conference. We will be posting updates, reminders and photos on Facebook throughout the Conference.

AAA Homepage: <https://www.facebook.com/AustralianArchaeologyAssoc> AAA2018

Event Page: <https://www.facebook.com/events/244585169355738/>

NZAA Facebook Page: <http://www.facebook.com/NewZealandArchaeologicalAssociation/>

Twitter

The official Conference hashtags are **#AAA40** and **#NZAA2018**

If you want to tweet about the Conference, please include the hashtags so that others interested in the Conference can find your tweets. If you are a Session Convenor and want to create a specific hashtag for your session please feel free to do so, and let us know by tweeting it to the AAA Twitter account via @AustArchaeology or NZAA @nzarchaeology so we can help promote its use for your session. AAA's Twitter username is AustArchaeology and NZAA is @nzarchaeology, you can tweet us by putting @AustArchaeology or @nzarchaeology in your tweet and our homepage is twitter.com/AustArchaeology or [/nzarchaeology](https://twitter.com/nzarchaeology)

Social Media Guide cont'd.

Live-Tweeting

We encourage live-tweeting during the Conference using the official hashtag, with the following caveats and suggestion for best practice:

- Do not post photos of people, presentation slides, photo competition entries or posters without the prior and express permission of the individual/s or author/s.
- Respect the wishes of presenters if they do not want their paper to be tweeted and presenters please make it clear if this is your wish. Remember that many people present unpublished work at the conference and you should use your best judgement when putting other people's research into the public sphere.
- Correctly attributing information is vital. If tweeting be sure to give the name of the presenter and be clear when you are directly quoting someone. Presenters: if you are on Twitter and are happy for people to tweet about your paper, you can put your Twitter username on your opening slide so the audience can accurately cite you online. Delegates: if you start your tweet with a username make sure you put a "." before the "@" so people other than that user can see it, e.g. '@AustArchaeology conference is being held in Auckland 27-30 November 2018'.
- Do your best not to misrepresent other people's views (even if you disagree with them) and post corrections if you slip up or someone misunderstands your tweet – ultimately, the message for live-tweeters is that you need to take seriously how you represent someone else's hard work and intellectual property online.
- There is no need to tweet everything a presenter says, a few take-home messages to capture what you personally found interesting/significant about their presentation is generally sufficient.
- Remember that Twitter is a public forum, so think twice when posting comments about the more social aspects of the conference; the general rule is to be collegial and respectful.
- Finally, enjoy it. Live-tweeting can be a great way to increase engagement and widen participation at a conference.

Important reminder about Conference Awards

Everything you post on Twitter using the Conference hashtag and on the AAA Facebook pages during the Conference is public and can/will get you nominated for the Small Boy/Big Man awards. You have been warned...

For more information about social media and live tweeting

AAA Website and Social Media Policies:

<https://australianarchaeologicalassociation.com.au/about/website-social-media-policies/>

For current list of Australian archaeologists on Twitter go here:

<https://twitter.com/AAASStudents/lists/ozarch-twitterati>.

For a run-down of key Twitter terms, there is a glossary available here:

<https://support.twitter.com/articles/166337?lang=en>

This guide was compiled by Jacq Matthews, @archaeo_jacq and Lorna Cooper, @lornacooperarch

Meetings

Meetings

AIAA Meeting

Wednesday 28 November from 12:30 – 1:30pm in Case Room 2

AO Editorial Meeting

Wednesday 28 November from 1:00 – 2:00pm in Case Room 3

ANCATL Meeting

Thursday 29 November from 1:00 – 2:00pm in Case Room 2

NZAA meeting

Thursday 29 November from 5:45 – 7:30pm in OGGB 3

AAA AGM

Thursday 29 November from 5:45 – 7:30pm in OGGB 5

AA Editorial Meeting

Friday 30 November from 1:00 – 2:00pm in Case Room 2

National Archaeology Week Meeting

Friday 30 November from 1:00pm – 2:00pm in Case Room 3

ICOMOS NSCRAA Meeting

Friday 30 November from 4:00 – 5:15pm in OGGB 3

Functions

Social Functions

Welcome Reception

The Welcome Reception will be held on Level 1 of the OGGB Building, Grafton Road, Auckland on Tuesday 27 November from 5.30 – 7.30pm. Platters and beverages will be served. Conference Registration will be open at the welcome event. This is a great opportunity to catch up with old and new acquaintances.

Meet the Graduates – Sponsored by CABA

Meet the Graduates is back again this year but in a slightly different format from previous years... co-hosted by AAA and the Centre of Excellence for Australian Biodiversity and Heritage (CABA). It will include sponsor stands, and a series of short talks by different archaeologists about their jobs and advice for graduates on how to get there.

Meet the Graduates will be held on Wednesday 28th of November (6pm – 8pm) in the OGGB level 1 foyer. The event is free of charge for all pre-registered students and recent graduates and for our Platinum, Gold and Silver sponsors only.

The evening is an opportunity for graduates to network in a relaxed environment with potential employers from the consulting, industry, government, research and education sectors. Representatives from our sponsors will be on hand to talk and answer questions from graduates. All graduates should have copies of their CV with them to hand out to interested potential employers. Platters and beverages will be served at the event.

Poster Session

The Poster Session will be held on Friday 30 November from 4.00 – 5.15pm on Level 0, OGGB Building. Poster presenters will be in attendance to discuss their posters.

Conference Dinner

The Conference Dinner will be held on Friday 30 November from 7.00pm - midnight in the Millennium Room at the Grand Millennium Hotel, 71 Mayoral Drive, Auckland.

The dinner consists of a 3-course dinner and beverages (beer, wine, soft drinks and juice) followed by a cash bar. There will be an awards ceremony, music and dancing.

Conference Dinner tickets must be pre-purchased at a cost of NZ\$120.00 per person.

Field Trip

Post Conference Field Trip

The NZAA - AAA conference is pleased to offer two post-conference field trip options on Saturday, 1 December. Please note each trip is limited to 70 places, so registration needs to be confirmed as soon as possible.

Tiritiri Matangi Island

Departs Auckland 9.00am (Pier 4, Downtown ferry terminal, Quay Street), Departs Tiritiri Matangi 3.30pm. The ferry trip is 75 minutes each way.

Tiritiri Matangi Island is a wildlife sanctuary in Auckland's Hauraki Gulf. In addition to its fascinating archaeological and historic heritage the island is home to some rare New Zealand bird species, including the kokako and flightless takahe, once thought to be extinct. This field trip will include a talk from Auckland Council archaeologist Robert Brassey on the early Maori settlement of the island and the wider Hauraki Gulf, and a talk from Department of Conservation archaeologist Neville Ritchie, on the Tiritiri lighthouse complex (1864-5). There will be considerable free time for self-directed exploration of the island.

Cost: \$103, including packed lunch

Rangitoto Island

Departs Auckland 9.15am (Pier 4, Downtown ferry terminal, Quay Street). Departs Rangitoto Island 12.45pm, 2.30pm, 4.00pm and 5.00pm – at the field trip participant's discretion. The ferry trip is 25 minutes each way.

The iconic Island of Rangitoto is the youngest and largest of the Auckland volcanic field's many volcanoes. Last erupting around 600 years ago, it provides a unique example of establishing pohutukawa forest among lava fields, together with baches (small beach houses) dating from the 1920s and 1930s. This field trip will include information from Department of conservation archaeologist Angela Scott on the bach settlements, with access to one or two. There will be considerable free time for self-directed exploration of the island.

Cost: \$62.00, including packed lunch

It is recommended that participants arrive at the downtown ferry terminal 30 minutes prior to departure – as ferries are public sailings, the boats cannot be delayed for late arrivals.

Note that the trips will proceed rain or shine. If you plan to attend either trip, you will need good walking shoes, suitable clothing, sunscreen, and for Tiritiri Matangi a backpack or bag that is able to be fully zipped (for biosecurity purposes).

Awards & Prizes

Awards for AAA members as follows:

- Best Overall Poster
- Best Student Poster
- Best Runner-Up Student Poster
- Best Paper
- Best Student paper
- Daryl West Prize
- Laila Haglund Prize
- Rhys Jones Medal
- Bruce Veitch Award
- AAA Life Membership Award
- John Mulvaney Book Award
- Ulm-Ross Prize
- ‘Small Boy and Big Man’ Awards

Awards for NZAA members as follows:

- Best Student poster award
- Best Overall poster award
- Best Student paper award
- Photo Competition winner
- Archaeology in New Zealand Best Student paper award
- NZAA Outstanding Contribution to Archaeology Award
- Roger C. Green Lifetime Achievement Award
- Honorary NZAA Membership Award

Concurrent Sessions

Concurrent Session Abstracts

Advances in the Zooarchaeology of Oceania

Zooarchaeology has a long history in Oceania – some of the earliest archaeologists in Australia and New Zealand, both amateur and subsequent professional researchers, were concerned with understanding the relationships between extinct megafauna and newly arrived people. Today the sub-discipline continues to produce high-quality outputs throughout the region and its practitioners regularly contribute to the global conversation about how societies in the past structured their economies for subsistence and/or socio-political outcomes and its impact on biogeography, faunal community structure and environmental change. This session will include papers examining new methods for analysing aquatic and terrestrial faunal remains, such as DNA, stable isotope and peptide analyses, as well as novel approaches for interpreting conventional zooarchaeological data, ranging from advances in the application of biodiversity statistics to multi-species approaches.

Convenors

Ariana Lambrides, *James Cook University*
Matthew Campbell, *CFG Heritage Ltd*
Stuart Hawkins, *Australian National University*

Archaeological applications of XRF analysis in Australia, New Zealand and the Pacific

Archaeological research in Oceania has benefited greatly from compositional elemental analyses. Over the past 20 years we have seen marked improvements in instrumentation, calibration and analytic techniques and the accumulation of comparative datasets have increased our understanding of XRF technology and its potential

to address archaeological questions. In particular, the availability of inexpensive and non-destructive portable X-Ray fluorescence analysers (pXRF) has revolutionised the way in which compositional analyses are incorporated into research programmes.

This session welcomes papers on XRF analyses of stone, obsidian, volcanic glass, rock art, ceramics, soils and metals from archaeological research in Australia, New Zealand, the wider Pacific region and beyond. Our aim is to showcase and review current XRF methods, pitfalls and limitations, and to discuss solutions for XRF analysis of archaeological materials, and address three inter-related questions: 1) How can we overcome known issues with hardware and software? 2) What can we do to promote collaboration, data sharing, and replicability? and, 3) Given what XRF results have contributed to our current understanding of the past in the region, where do we go from here?

Convenors

Michelle Richards, *Australian National University*
Andrew McAlister, *University of Auckland*

Archaeological replication in contemporary research

Replicative studies are powerful epistemological tools in archaeology, but experimental archaeology– as an archaeological research method– has not been fully embraced in New Zealand or in other areas of Oceania. Such studies, carried out in either controlled or experiential settings, can answer well-defined research questions or simply clarify the concepts researchers invoke to think about archaeological material culture. The purpose of this session is to provide an international platform for contemporary replicative research in

Oceania and to foster replicative approaches in New Zealand archaeology. Additionally, this session aims to facilitate the expansion of an international community of experimental archaeologists and craftspeople. Any persons are invited to submit abstracts of their replicative work regardless of focus area, degree of experimental control, or background.

Convenor

Robin Torrence, *Australian Museum*

Archaeology and radiocarbon dating in Oceania: where are we now and where to from here

Over the last 20 years there have been significant advances in radiocarbon method and theory and many new recommendations have been made for achieving reliable archaeological chronologies. However, the majority of these advances have taken place in the Northern hemisphere with funding dedicated to geoscience, paleoclimate and oceanographic research. As the poor cousin, radiocarbon applications in archaeology have often relied on adapting these findings. Where recommendations have been made that are based specifically on archaeological research, they have not been designed for the unique conditions and questions present in Oceania. Of note, Bayesian chronologies that successfully result in shorter duration and more accurate chronologies in the continental north, are complicated by the diversity of materials in our region, in particular shell dates.

We invite presentations on aspects dedicated to archaeological applications of radiocarbon, with an emphasis on identifying and addressing key problems relevant to Oceania.

Convenors

Fiona Petchey, *University of Waikato*

Magdalena Schmid, *University of Wollongong*

Archaeology: telling our story

The theme for a recent international conference on the Public Communication of Science and Technology was 'Science, Stories and Society'. When working in Australasia

and the Pacific, whose stories are archaeologists really telling? How do we involve different audiences in those stories, and why should they want to be involved?

The public communication of research is becoming increasingly important and, when the research involves local communities, there are social and cultural implications to consider. The drive to involve the public in not only sharing results, but actually conducting the research, has been shown to have great impact on future research processes and community values. However, it also presents a number of challenges to the researcher. Is the new wave of 'participatory science' feasible in Archaeology?

After a well-attended NZ Archaeology Week this year, this session is an opportunity to share our experiences, successes and challenges, and to discuss how we can increase engagement with public audiences, by:

- involving local communities in conducting the research itself, as well as sharing the outcomes with different audiences
- articulating the purpose for public engagement activities; and
- rethinking / exploring how we design and evaluate our outreach activities.

We suggest this session includes time for a panel/round-table discussion with the speakers.

Convenors

Ashleigh Fox, *University of Auckland*

Samantha Lagos, *University of Auckland*

Australasian and Pacific Archaeology – new perspectives on disciplinary history

This year's conference theme, Trans-Tasman Dialogues, highlights the fact that Australian archaeology and New Zealand archaeology share many historical roots. However, there are also important differences in the historical development of archaeological theory and practice in these two countries. Additional shared and distinctive aspects become apparent when we consider Australian and New Zealand archaeology within the context of the wider Pacific region. A better understanding of the history of archaeology is essential to help us critically assess current archaeological

practice, challenge outdated theories, and adequately acknowledge the contributions of diverse national, linguistic and faith communities, as well as women and Indigenous people of Australia, New Zealand and the wider Pacific, to the development of archaeology in our region. This session builds on the growing interest in the history of archaeology expressed in recent special issues of the *Journal of Pacific Archaeology* (Vol. 8, No. 1, 2017) and *World Archaeology* (Vol. 49, No. 2, 2017), as well as a forthcoming special issue of the *Journal of Pacific History*. We welcome papers on any aspects of the history of archaeology in New Zealand, Australia and the wider Pacific region.

Convenors

Tristen Jones, *The Australian National University*

Hilary Howes, *The Australian National University*

Harry Allen, *The University of Auckland*

Matthew Spriggs, *The Australian National University*

Bioarchaeological perspectives on sedentism and mobility from both sides of the ditch

In Australia and New Zealand bioarchaeologists are grappling with theoretical and methodological approaches to human movement. These studies span geographical scales, from movement between continents to local movement within a regional zone. They also cross time zones from movement within an individual's lifespan to movement of remains after death.

In both countries bioarchaeologists are using a range of methods now to address these issues: from stable isotope studies, classic analyses of pathology, to the detailed reconstruction of burial practices and the movement involved. The goal of this session is for us to interrogate what is meant by the umbrella terms of sedentism and mobility and how the use of different methods highlights particular windows on human movement. In this session we will bring together studies of indigenous and European mobilities.

Covenor

Judith Littleton, *University of Auckland*

Contacts and exchanges in Oceania

Over 25 years ago, Pacific scholar Epeli Hau'ofa put forth the notion of a 'sea of islands', linked by extensive networks of exchange that flowed between islands across the ocean waves. That Pacific Islanders travelled between islands, sometimes over hundreds or even thousands of kilometers, was an observation made by the earliest European chroniclers of the region. Archaeologists have documented complex exchange networks largely through the movement of portable materials including ceramic and stone. These types of analyses have been augmented by the influx of new techniques and technologies, which have further developed the sense of how widespread Pacific voyaging was in the past. Evidence for exchange can be connected to a related (but not equivalent) term, 'contact', referring to the cross-cultural interactions that took place in the region. While contact is usually used to refer to European colonial encounters, it can also refer to the pre-European interactions between different Oceanic societies. This session will showcase current research on material exchange and cross-cultural encounters in the Oceanic past.

Convenors

Dr James Flexner, *University of Sydney*

Dr Christian Reepmeyer, *James Cook University*

Charles Radclyffe, *Otago University*

Nick Hogg, *Otago University*

Cook's nails and archaeology

Indigenous archaeology is a broad and popular term in Australia with tertiary programmes and practice, whereas it is completely absent in the language and practice of archaeology in Aotearoa. Its absence can be seen in the context of the Resource Management and Pouhere Taonga Acts where archaeology distinguishes itself from Maori or tangata whenua knowledge and cultural values. The separation of science and human history from a living culture, and descendant communities (hapu and iwi) from their ancestors (tupuna).

In the post-settler former colonies of Australia, Canada and USA, the debate of indigenous archaeology has generally centered on being collaborative and community based, but with indigenous knowledge and experience informing Western archaeology. The iron nails of James Cook were a popular commodity for

trade during his voyage around the coast for its use as a tool. Is archaeology a tool for indigenous knowledge or Mātauranga Māori? Is there a Māori or Aboriginal archaeology?

This session invites papers to this theme that is open to comment, interpretation, experience or theory.

Convenor

Des Kahotea, *University of Waikato*

Crossover between Indigenous and European cultures; similarity and inclusivity in practice

The colonisation of Indigenous lands presented opportunities to share resources for use in cultural practices and activities of daily living – evidenced by archaeological finds of traditional tools made from modern materials such as glass and ceramics or the use of Indigenous traditional knowledges of the land for farming practices.

This session looks to include papers that explore the relationship and knowledge sharing between Indigenous and European peoples to evolve in practice, as a people and for the purpose of surviving the changing world.

Convenors

Barbara Allen, *Kurnu – Baakandji Aboriginal Traditional Owner, Chairperson of the Toorale Joint Management Committee*

Mandy Atkinson, *Heritage, Biosis*

Dialogues about country: cultural landscapes and collaborative narratives

When cultural heritage management was first introduced into Australia in the late 1970s, the focus for research and practice was archaeological sites. Today, the narrow definition of heritage as purely relating to tangible/archaeological remains of past human behaviour has been countered in heritage discourse, legislation, and policy. Cultural heritage management as it is practised in the 21st Century incorporates a range of elements: archaeological sites and tangible heritage containing

evidence of past and recent cultural activities; intangible heritage, including stories, social practices, and rituals associated with both physical sites and the landscape generally; and the cultural landscapes – the wider natural and environmental context – associated with sites and places of value. A cultural landscapes setting for archaeological and heritage research and practice provides the context for the interpretation of places and objects, and the cultural values (including beliefs, stories, songs, etc.) associated with these places and objects. It also provides the framework for archaeological narratives of the past more generally.

In this session we invite papers that explore narratives of the past that incorporate both archaeological information and the knowledge of Indigenous collaborators. The session will focus on the capacity for a cultural landscapes approach to site and artefact analysis, which also incorporates Indigenous ways of knowing, to provide a nuanced social perspective on archaeology and heritage management. We encourage all papers to be jointly authored by professional researchers and community collaborators, and for presentation of papers to include at least one researcher and one community participant. We recognise that costs may prohibit all collaborators to attend the conference in person, so video clips or sound grabs of other speakers, or other technical ways to ensure breadth of participation, is acceptable.

Convenors

Michael Slack, *Scarp Archaeology*

Annie Ross, *School of Social Sciences, The University of Queensland*

Digital Archaeology – computers for fieldwork, analysis, research and reports

We have basically reached a point where we are all, in some ways, ‘digital archaeologists.’ Computers, digital data, and applications permeate all aspects of what we do, in the field, in the laboratory, in the classroom, and in the office. Building on Roosevelt et al. (2015), Richardson and Lindgren (2017) attempt to deconstruct the underlying hegemonies and power relationships inherent within the use of digital technologies.

Richardson and Lindgren (2017:139), whilst acknowledging “digital archaeology as the technical underpinning of modern archaeological practice” warn against a “digital

dualist trap, which profoundly misrepresents both the 'real' and the 'virtual' – the 'online' and the 'offline' – and advocate for an increased focus on the communication of archaeological knowledge and the role that digital technologies can play in this sphere.

In the spirit of fostering increased communication, this session presents the great variety of current work on digital applications in archaeology, cultural heritage, and allied disciplines, and theoretical examinations of the role of digital technologies in our work.

Whether you use computers or digital data in any form in the field, the lab or at your desk, or you want to deconstruct the digital revolution in our disciplines, we look forward to welcoming you to join the discussion.

References

Roosevelt, C., Cobb, P., Moss, E., Olson, B., and Ünlüsoy, S. 2015. Excavation is destruction digitization: advances in archaeological practice. *Journal of Field Archaeology*, 40: 325–346.

Richardson, L-J and Lindgren, S. 2017. Online tribes and digital authority: what can social theory bring to digital archaeology? *Open Archaeology*, 3: 139–148.

Convenors

Claire Reeler, *University of Sydney*
James Flexner, *University of Sydney*
Yann Trisitant, *Macquarie University*

Disaster archaeology

Unfortunately, natural disasters are a part of the world in which we inhabit, and the impacts and that these have on societies past and present can be immense. These challenges include the threat to the archaeological resource, and also in the management of heritage issues after the disaster. The difficulties faced by the heritage industry generally consist of how best to rescue and record the archaeology, while at the same time allowing the recovery, repair and rebuild of the affected area. Experiences from disaster recovery projects in New Zealand and Australia has resulted in some very large scale archaeological investigations being undertaken.

Through these, archaeologists have made some significant discoveries, developing a wider understanding of the cultural heritage of affected regions. Additionally, many innovations and efficiencies of archaeological methods and procedures have also been developed.

Papers that discuss all aspects of archaeology following natural disasters, and natural disasters recorded in the archaeological record.

Convenor

Sheelagh Conran, *WSP Opus*

(E-)Scapes: the archaeology of scapes through time and space

This session aims to investigate the theme of -scapes, an umbrella term that encompasses a wide range of studies into how humans – through their daily activities, beliefs and values – define and shape physical space into meaningful places. We invite papers engaged with the investigation of any kind of scape (landscapes, seascape, riverscape, skyscapes, taskscapes, powerscapes, soundscapes, but also symbolic representations of -scapes as found in material culture and iconography) across time and space. It is our specific intention to bring together researchers working in Old and New World Archaeology, confronting theories and approaches.

Convenors

Dr. Gijs Tol, *University of Melbourne*
Professor Louise Hitchcock, *University of Melbourne*

Enabling archaeologists: A conversation towards accessibility and inclusion in archaeology and cultural heritage management

This conference creates an opportunity to have a Trans-Tasman and multi-disciplinary discussion on inclusivity in cultural heritage and archaeological practice, study, and research. Considerable progress has been made towards disability awareness and inclusion within UK and European archaeology. This session aims at creating similar conversations about inclusion and accessibility in Antipodean archaeology. We are looking for examples of cross-disciplinary approaches and experiences that have been applied to the myriad of challenges that create inclusion for the wider community in archaeology and cultural heritage management. The central aim of this session is to explore how we can expand archaeology beyond a privileged space that allows wider participation and community engagement. An opportunity for this session is to highlight individual achievements by many members of the archaeological community to share their lived experiences and innovative approaches to participate in archaeology and cultural heritage management. This session also aims to explore the creation of a common language that allows the development of approaches in establishing best practice for inclusivity and accessibility within archaeology and cultural heritage management. Therefore, we welcome papers that inspire, and aspire, to creating and improving social justice for inclusion and accessibility in Trans-Tasman archaeology and cultural heritage management.

Convenors

Dr Daryl Wesley, *Archaeology Flinders University*

Ms Clara Santilli, *Archaeology Flinders University*

Mr Andrew Wilkinson, *Flinders University*

Gender and archaeology

Gender is just one of many lenses or frameworks through which the past can be viewed. Looking at the past with a gendered lens helps us understand how gender functioned in the past and the role it continues to play in society today, and to understand how our own biases have developed. It is also important because it was a lens that was ignored for so many years, resulting in many false assumptions about the roles of men and women in the past.

It is only by understanding this that we can hope to move beyond these biases. This session seeks papers that look at the archaeological record with a gendered lens, regardless of place or time period, to make women visible, to give us a more complete knowledge of their activities and to place value on how women have contributed to social development.

Convenors

Katharine Watson, *University of Canterbury*

Dr Maria Lillo Bernabeu, *Underground Overground Archaeology*

GIS – mapping space and time

This session is about the map and the thinking behind it – the audience, the goals and aspirations that frame it – the practitioners who use GIS as much as they use a trowel. GIS is a powerful tool because it apportions space and place within categories of significance, importance, and conservation. It could be argued that the mapping requirements of archaeological research projects generally prioritise time whereas the mapping requirements of heritage and commercial projects tend to prioritise space.

Many of the places, times and spaces that make up the archaeological record do not fit neatly into the bounded spaces on a map. Can intangible heritage be mapped? Can the spatial, temporal, and material aspects of the archaeological record be defined clearly using current GIS outputs? GIS is entrenched as the preferred tool of the archaeologist, the developer, and the surveyor for defining spaces, times, and places of archaeological and cultural significance. This session discusses the theoretical and methodological underpinnings of GIS and the application of GIS in academic and commercial research projects.

We invite papers on GIS, particularly GIS projects that incorporate Participatory GIS, Counter-mapping, Deep mapping, Intangible heritage, Collaboration, Cultural Heritage Management, and Community Engagement.

Convenors

Katherine Thomas, *La Trobe University*

Renee McAlister, *Heritage Insight*

Colin Pardoe, *The Australian National University*

Heritage tourism & property development as an agency for transformation

Archaeological sites and landscapes are objects of cultural heritage often re-packaged and re-branded to appeal to a target audience – in this instance the heritage tourist, the property owner/developer selling ‘the dream’.

Heritage tourism and Property Development are growing consumer markets which involve transformation of perception, site and identity.

The development, promotion and or marketing of archaeological sites is often aimed at creating landscapes for consumption, selling the ‘dream’ or ‘snapshot’ of the past, rather than accommodating the knowledge provided by local communities, indigenous communities, historians and archaeologists.

Heritage Tourism targets a certain type of tourist keen to experience the ‘amenity factor’ or ‘unique historical rarity’ of place. Property Development is acquisition centric and seeks to modify and market the above factors as ‘the hook’ in order to profit from selling compartmentalised landscape.

Both Heritage Tourism and Property Development are based on:

- the consumption of a projected idea and popular image
- tapping into human compulsions – to explore, seek out, acquire, build
- the quest for experience and that ‘AHA’ moment
- fiscal motivation

Heritage Tourism can be a boon or a curse as tensions rise to the fore when tourists, tourist ventures, locals, archaeologists and descendent communities interact with one another or with their respective ‘objects’ but in different ways. Property Development potentially eradicates ancestral footprints and has another subset of tensions and flashpoints. Both consumer markets are dynamic and evolving.

Papers in this session critically address one or more of the issues discussed.

Questions of interest include: Is superimposed identity

a real thing-acquisition of the other? Are promotional campaigns messing with established identity? What are the growing trends and or strategies of site commodification? Are they measurable and if so how? How are archaeological sites being represented in public and popular imagery-problematic or a non-issue? Is there a growing trend for the Disney-fication of archaeological sites and heritage landscapes? Consumer profile – who are they? Is there such thing as a leisure seeking tourist class? Is archaeology seen as a leisure activity? Host versus guest inversion-when the roles reverse? What happens when those who have traditionally challenged developmental pressures transition into The Developer.

Convenors

Makere Rika-Heke, *Heritage New Zealand Pouhere Taonga*

Xavier Forde, *Heritage New Zealand*

The importance of islands in archaeology

Islands have played a significant role in New Zealand, Australian, and Pacific Basin archaeology and in a wide range of other disciplines. Surrounded by water barriers, islands were considered ideal laboratories in which to observe the relationship between humans and the environment influenced in particular by the seminal work of Robert MacArthur and Edward Wilson's 1967 book *The Theory of Island Biogeography*. More recently, as Matthew Spriggs (2008:212) has noted, the waters have been muddied somewhat by trenchant criticisms of the ‘islands as laboratories’ concept. We suggest that Fosberg's 1963 definition of islands, although outdated in some aspects of language and approach, is still relevant to the study of island archaeology.

Relative isolation, limitation in size (space resource); limitation in, or even absence of certain other resources; limitation in organic diversity; reduced interspecies competition; protection from outside competition and consequent preservation of archaic, bizarre, or possibly ill-adapted forms; tendency toward climatic equability; extreme vulnerability, or tendency toward great instability when isolation is broken down; and tendency toward rapid increase in entropy when change has set in (Fosberg 1963:5).

We seek papers that critically address Fosberg's island characteristics or combinations of these or other island characteristics. In short we invite papers that conceptualise islands in archaeology rather than those that focus on finds and archaeological sequences.

Fosberg, F.R. 1963. The Island Ecosystem. In Fosberg F.R. (ed) *Man's Place in the Island Ecosystem*, pp.1-6. Honolulu: Bishop Museum Press.

Spriggs, M. 2008. Are islands islands? Some thoughts on the history of chalk and cheese. In Clark G., Leach F. and S. O'Connor (eds) *Colonization, Seafaring and the Archaeology of Maritime Landscapes*. Canberra, ANU Press.

Convenors

Mike Rowland, *James Cook University*

Ian McNiven, *Monash University*

Sean Ulm, *James Cook University*

Oceanic horticulture – advances in recent research

Horticulture has been a major theme for archaeological research, not just in New Zealand but throughout Oceania. Such research has been prominent throughout the Pacific and remains active and ongoing. It has had several foci; from ethnobotanical to examination of the physical properties of agricultural soil, along with analysis of secondary archaeological elements associated with horticulture, for example kumara storage pits in New Zealand and breadfruit fermentation pits in tropical Oceania. As well as informing us about a significant economic activity and its associated technologies, the study of horticulture has also underpinned much of the social evolution theory applied to Oceanic societies. It has also focused on the adaptation of a suite of domesticated tropical plants to small island environments and to climatically marginal environments such as New Zealand and Easter Island.

This session welcomes papers discussing all aspects of historic and traditional horticulture throughout Oceania.

Convenor

Warren Gumbley, *Australian National University*

Pacific rock art research

Australia is a hotspot in international rock art research whereas studies elsewhere in Oceania are more sporadic reflecting flare-ups in research interest rather than systematic support of traditional owners and kaitiaki of rock art heritage.

This session invites updates on localised or regional rock art research and management initiatives and particularly looks for comment on how they contribute to and/or may benefit from connections with wider rock art endeavours in the Pacific. It also welcomes outlines of developments in management approaches, research practices or particular investigative techniques with comment on how those may be relevant and accessible across our region.

Convenor

Gerard O'Regan, *University of Auckland*

Past, present and future maritime pathways

Oceans are often seen as boundaries that separate; however, in the past, they were pathways — connecting people, ideas, technologies, economies and traditions. Australia and New Zealand have longstanding connections to the sea and their internal waterways. Both countries share aspects of migration, trade, naval, shipbuilding, and ritual maritime histories. In particular, the two countries shared an intense trading relationship in the nineteenth century that contributed to the expansion of their historic economies. In recent decades, archaeological projects have been undertaken in Australasia to investigate, submerged indigenous sites and landscapes, early European exploration, riverine histories, coastal infrastructure, naval histories, shipbuilding practices, trade, migration and whaling. In response to this important resource, both countries have acknowledged the significance of their maritime heritage in law. Current legislation although different in each country contributes to the protection and promotion of their rich maritime heritage. However, much is still to be done regarding, public awareness, management and the on-going protection of this important archaeological resource.

This session invites papers to celebrate our past maritime heritage, to present on current maritime archaeological projects and to encourage discussion for future pathways relating to the promotion and protection of maritime heritage in Australasia.

Convenors

Kurt Bennett, *Flinders University*

Matt Carter, *La Trobe University*

Place stories: archaeology – emotion – entanglement

For this session, we invite archaeologists to share a story concerning a real, imagined or virtual place that has had a powerful impact on their way of thinking about, practicing, experiencing and/or communicating archaeology. There are various places where the inspiration, work and production of archaeology take hold, such as field 'site's, landscapes, the laboratory, storage repository, library and archive or even the written page. There are also fictional spaces or territories in the archaeological imagination that shape who we are and what we do, such as a film setting, a scene in a novel or a locale pictured in a photograph. Consequently the places we are calling for are mediated through all kinds of materials and media, whether an object or collection/ assemblage, or through the senses or emotions. What will unite these stories is that place – however defined – is central to the narrative and pertinent to the participant's experience of archaeology. We encourage use of the first person; and are open to creative forms of story-telling, expression and performativity. We are seeking stories that speak to encounters arising from professional, personal or domestic life that have inspired, shocked, pleased and/or shaped you as an archaeologist and human being.

Rather than the normal 20 minute session format, we propose a series of six-minute presentations. We will invite submissions comprising a title, short abstract (less than 100 words) and tweet-able summary (up to 160 characters). We envisage that the papers will cover a variety of the themes identified in the call for sessions (maritime, rock art, public archaeology, etc) We are currently discussing a book proposal with Routledge, and will be keen to speak to interested presenters to develop 2,500 word essays for publication. The proposed volume is intended as a companion to the successful public archaeology volume *Object Stories: Artifacts and Archaeologists* (Left Coast Press/Routledge 2015).

Convenors

Ursula Frederick, *Australian National University*

Steve Brown, *University of Sydney*

Telling our stories: archaeology for the people

The ever-expanding digital realm presents increasing opportunities for archaeologists to communicate with the public. In particular, there has been a veritable explosion of archaeological news and information disseminated through news channels and social media in the past decade, and this has broadened the reach of our message to a much wider audience of both experts and non-experts. In this context, the way in which our stories are communicated, and the ways in which the public are engaged with the material culture past, become important. In this session, contributions from archaeologists, educators, museum, interpretation and heritage professionals, academics and journalists who communicate to audiences of non-archaeologists via school curricula, digital technologies, online blogs, social media, site interpretations, museums, popular magazines, books and journals, TV and radio are welcomed.

Convenor

Melissa Riley, *University of Tasmania*

Wednesday 28 November 2018				
8.30-10.00		Conference Opening		
10.00-10.30		Morning Tea		
	Theatre 098	OGGB3	OGGB4	OGGB5
10.30-12.30	Cooks nails and archaeology (including Crossover/Indigenous/European)	Archaeological applications of XRF in Australia, New Zealand and the Pacific	GIS -mapping space and time	Oceanic horticulture - advances in recent research
10.30-10.50	Nāia te toa a Tarewai! Taking control of the past. Rachel Wesley	Plastic in Archaeology (PIA): Initial investigations into Australian archaeological collections using ATR-FTIR and FTIR reflectance Sharon Wong	Another New Archaeology Colin Pardoe	The Cabana Site: Review of evidence for horticulture in the early Settlement Phase of New Zealand. Mana Laumea
10.50-11.10	A history of Ngati Pukenga through pa Des Kahotea	Geochemical analysis of obsidian in New Zealand Andrew McAlister	Interpretations of Spatial Data in the Northern Growth Corridor of Melbourne, Victoria Renee McAlister	Signature Pits Caroline Phillips
11.10-11.30	Protecting wahi tapu and wahi tupuna in the face of development Adreane Ormond	The Sharpest Tool in the Shed: An Analysis of Stone Adzes from the Auckland (Tamaki) Region. Brendan Kneebone	GIS as a tool for better informed heritage management Greg Hil	An investigation of Māori gardening practices at the Okurupunga stone rows, Wairarapa Lara Shepherd
11.30-11.50	Connecting with spirits from the land: Indigenous cultural protocols in consulting Jasmine Willika	Using matrix matched calibrations for archaeological research Christabel Brand	Surveying multi-year excavations: Lessons from Ahuahu Matthew Barrett	Multi-tasking at Horotiu: Mixed Crops, Pits and Pounamu Kirsty Potts
11.50-12.10	Archaeology and Maori David Robson	Realising the potential of non-destructive pXRF analysis in old museum collections Michelle Richards	Identifying siliceous 'tool stone' resources with advanced remote sensing: a case study from central Australia W. Boone Law	The Waikato Horticultural Complex: Aspects of the archaeology of intensified swidden horticulture Warren Gumbley
12.10-12.30	O Ke Kahua Mamua, Mahope Ke Kukulu: Building a Strong Foundation of Native Hawaiian Cultural Heritage Stewards. Kelley Lehuakeapuna Uyeoka	Pofatu: An open-access database for provenance analysis of stone tools in the Pacific A Hermann		Reinterpretation of island landscapes: LiDAR reveals extensive anthropogenic modification of entire islands in the Vanuatu archipelago Stuart Bedford

<p>Lunch</p> <p>AIAA Meeting – Case Room 2</p> <p>AO Editorial Meeting – Case Room 3</p>				
12.30-1.30	Theatre 098	OGGB3	OGGB4	OGGB5
1.30-3.30	Gender and Archaeology	Heritage Tourism and property development as an agency for transformation	GIS -mapping space and time	General papers session
1.30-1.50	Approaching rock art from a feminist perspective Maria Lillo Bernabeu	Heritage Tourism and Property Development as an agency for transformation. Makere Rika-Heke	Padding down the highway: Using GIS to explain the archaeology of the Kapiti Coast Mary O'Keefe	Experimentation and simulation: exploring post-depositional movement and technological variability in surface archaeology Natasha Phillips
1.50-2.10	Women breaking the rules Katharine Watson	Contributions of Archaeological Research to Indigenous Tourism Ventures: A Case Study from Maungaroa Valley, Rarotonga Gareth Walter	Mapping Country in the Willandra Lakes Region World Heritage Area (WLRWHA) Katherine Thomas	Explaining the unexpected: recent archaeological revelations from northern Aotearoa John Booth
2.10-2.30	Mary Byrne: a life in teapots Naomi Woods	Triggering Aboriginal Cultural Heritage Assessments in Property Development in South East Queensland: the need for a proactive, not a reactive process. Kate Greenwood	Using GIS to understand cultural dynamics through the lens of rock art, NE Kimberley, Australia. Challenges and potential of a geospatial analysis Mariangela Lanza	Hawaiki revealed: the identification of the ancestral homeland for an Early Polynesian seafarer group to Southern New Zealand based on the Petrology of their artifacts W. R. H. Ramsay
2.30-2.50	Archaeology and the Women's Christian Temperance Union Clara Watson	Cultural Induction and the use of Kaitiakitanga. Edith Tuhimata	A Satellite Imagery/GIS Survey for Aboriginal Archaeological places in Channel Country, SW Queensland. Doug Williams	Red earth of 'The Block', Takou, Whenua O Te Runanga O Ngati Rehia Chris Booth
2.50-3.10	Orphaned girls and educated boys: class and gender in colonial Western Australian children's institutions Meg Drummond-Wilson	Operating a heritage restoration project as an economic entity. Norcombe Barker	Maps, GIS and the inter-generational transfer of knowledge Hauti Hākopa	Quarrying and Adze Manufacture at Bluff Harbour, Southland, New Zealand Chris Jennings
3.10-3.30				The archaeology of human-induced disasters Jack Kemp

Wednesday 28 November 2018 continued					
3.30-4.00		Afternoon tea			
		Theatre 098	OGGB3	OGGB4	OGGB5
4.00-5.40	Enabling Archaeologists	Documenting skills, rewarding experience: towards accessibility and inclusivity within Australian archaeology and Cultural Heritage Management Australian National Committee for Archaeology Teaching and Learning (AAA)	Heritage Tourism and property development as an agency for transformation Managing Cultural Landscapes in the Mallee Region of northwest Victoria Rhiannon Ashton	The importance of Islands in archaeology Pleistocene Coastal Occupation and Holocene Islandisation: An example from Barrow Island, North-Western Australia Kane Ditchfield	Telling our stories: archaeology for the people Let Them Eat Static: Public archaeology and mass media in the twenty-first century Stephen Nichols
4.00-4.20					
4.20-4.40		The All Inclusive Archaeology Student: the first steps of Enabled archaeology research at Flinders University of South Australia and perspectives about how accessibility, inclusion and diversity make for a stronger generation of future archaeologists. Clara Santilli	Nga Taonga Tuku Iho me Nga Tapuwae Xavier Forde	Aboriginal resilience and the role of marine invertebrates during the Holocene islandisation of Barrow Island, North-West Australia Fiona Hook	Museum in my pocket and Shoe-box archaeology. Engaging Western Australian communities through living archaeology and social media Richenda Prall
4.40-5.00		Inclusion and Diversity in consulting archaeology: Why does it matter? What are the benefits? What are the challenges? Vanessa Beasley	Beginners Guide to Moving Small Heritage Buildings – Williams Rees 1864 Meat Shed, Lake Wakatipu Matt Schmidt	Conceptualising islands - Not Isolation v integration, rather constraints as a mechanism for cultural opportunity James Robinson	Weather it Together: Communicating Climate Adaptation for Cultural Resources Rebecca Ramsay
5.00-5.20		Towards inclusivity in archaeological research and practice: An academic perspective Daryl Wesley	Panel Discussion Makere Rika Heke and Xavier Forde convening	Human Responses to Sea Level Changes: An example from Stradbroke Island, Moreton Bay, Southeast Queensland. Richard Robins	Calling all #Twitterstorians and #Archaeotweeps! Spreading the word about Australian archaeology via a social media conference – the case of #Archaeotweet2018 Melissa Riley
5.20-5.40		Panel Discussion Daryl Wesley convening		The Importance of Islands – From Whakahau to Ganumi Bara Michael J Rowland	
18.00-20.00					
Meet the Graduates					

Theatre 098				
	OGGB3	OGGB4	OGGB5	
8.30-10.30	Dialogues about country Jacinta Koolmatrjie	Bioarchaeological perspectives on sedentism and mobility Sarah Karstens	Archaeological replication in contemporary research Amy Mosig Way	
8.30-8.50	Yarta, Muda and Yura malka Jacinta Koolmatrjie	The Bioarchaeology of mobility: addressing issues of time and distance Sarah Karstens	The identification and recovery of backing debitage: a new method for detecting backed artefact industries Amy Mosig Way	
8.50-9.10	The Deep Time landscape of Purlikunti and the Juukan 2 Site: Pleistocene human occupation, environmental change and connections in the central Pilbara, Western Australia Michael Slack	The creation of a Strontium "isotope" of Fiji and the Solomon Islands Andrea Ulrichsen	Use of experimental evidence to interpret the function of pits on stone artefacts from Australia and Papua New Guinea Nina Kononenko	
9.10-9.30	Reconstructing a peopled landscape in the Pilbara Michael Slack	In search of the land of milk and honey - using isotopic approaches to study colonial mobility Charlotte L. King	Doog (pound) gimdi (Vitex glabrata). Experimental archaeology and the archaeological record, Gooniyandi Country, Western Australia India Ella Dilkes-Hal	
9.30-9.50	New collaborations of whaling and Ngarrindjeri whale enchanting from Encounter Bay, South Australia Christopher Wilson	Life and Death on the Otago Frontier: A bioarchaeological study of Otago European and Chinese Gold miners and early settlers Hallie Buckley	The making of Melo spp. shell knives in northern Australia: A comparative study of archaeological, experimental and ethnographic data Fiona Hook	
9.50-10.10	Connecting Language, Places, Stories, and Archaeology for Landscape-level Heritage Preservation: A Case Study of Eyak Lake, Alaska David R. Guilfoyle	Isotopic methods to examine migration and mobility: Australian case studies Tim Owen	Gunflints from obsidian? An experiment to interpret the function of a specific type Bengi Basak Selvi	
10.10-10.30	Discussant: Liam Brady	Variety and process: potential motion for New Zealand mortuary archaeology Beatrice Hudson		
10.30-11.00	Morning tea			

Thursday 29 November 2018 continued

	Theatre 098	OGGB3	OGGB4	OGGB5
11.00-1.00	Dialogues about country	Contacts and exchanges in Oceania	Bioarchaeological perspectives on sedentism and mobility	Archaeological replication in contemporary research
11.00-11.20	Archaeological and cultural analysis at Te Totara: A rare event Craig Reedy	Who was Polynesian? Who was Melanesian? Identities and Ethnogenesis in the South Vanuatu Outliers James L. Flexner	Isotope Bioarchaeology: prehistoric and post-colonial research from Cape York, North QLD Shaun Adams	Investigation of Shell Bead Manufacture, Dampier Archipelago, north-western Australia Wade Goldwyer
11.20-11.40	The role of archaeology in the equitable management of wilderness areas. Silas Piotrowski	Investigating a South Vanuatu interaction sphere: pXRF analysis of oven stones from Aniwa Island Christian Reepmeyer	Investigating settlement patterns and questions of mobility in Mithaka country, on the eastern edge of Australia's arid centre Michael C. Westaway	Replication, copying and experimenting within Archaeology Lisa McKendry
11.40-12.00	Turtles, tracks and totems: mapping moving through a narrated landscape E. Jaydeyn Thomas	Relationships etched in stone: Sourcing the Caution Bay ground stone tool assemblage to examine the antiquity of exchange networks between the coast and lowland interior of the south coast of Papua New Guinea Bradley Goodall	The creation of a 3D GIS from plan drawings of the Aboriginal Burial Ground at Roonka, South Australia Joshua Emmitt	Modern flintknapping in Australia: Stone-flaking in the internet age Mark W. Moore
12.00-12.20	Narrating Calga: archaeology, ethnohistory and Aboriginal knowledge Sharon Hodgetts	Straits as water barriers or ocean highways: an archaeological investigation into the prehistoric settlement and development of networks of interaction in Manning Strait, Solomon Islands Charles Radclyffe	Investigating the origins and impacts of tuberculosis in the Pacific Kate McDonald	'Fun with lithics' in the Maros-Pangkep reGENCY of Southwest Sulawesi, Indonesia Yinika Perston
12.20-12.40	A Consideration of the Secret Sacred Room, Queensland Museum, as a Contemporary Cultural Landscape Anna Weisse	Comparative Review of Exchange Networks in the Solomon Islands with a focus on the Western Solomons Peter Sheppard	The bioarchaeological implications of human movement: testing the Osteological Paradox in Victoria, Australia, 1853 to 1916 Georgia Roberts	
12.40-1.00	Discussant: Steve Brown	Discussion	Initial colonisers and early settlers: isotopic insights into migration and subsistence patterns in the prehistoric Pacific Islands Rebecca Kinaston	Hawkes Bay silicified limestone artefacts: the role of replication and experiments in understanding hafted stone adze manufacture and use Phillip Belcher
1.00-2.00	<p>Lunch</p> <p>ANCATL Meeting – Case Room 2</p> <p>1.20-2.00 Taylor & Francis Workshop – Publishing in Academic Journals – OGGB 5</p>			

Thursday 29 November 2018 continued					
	Theatre 098	OGGB3	OGGB4	OGGB5	
2.00-4.00	(E-)scapes: The archaeology of spaces through time and space Anne O'Hagan	Contacts and exchanges in Oceania Triangular men on a very long journey (again): long distance voyaging and Hawaiian interactions in petroglyphic rock art of Tonga David Burley	Archaeology and radiocarbon dating in Oceania Remember, ¹⁴ C is an environmental isotope - how can we put this to good use in our chronologies? Fiona Petchey	Disaster archaeology	
2.00-2.20	On the Road Again: Learnings from roading and other transect-like projects Anne O'Hagan			The emotional landscape of the Christchurch rebuild Kathy Davidson	
2.20-2.40	Unmaking rivers: Landscapes of Flow on Victoria's Loddon River Susan Lawrence	The archaeology of trans-Pacific interactions. Cultural transmission between Polynesia and South America. An update on recent research in Chile Karolyn Buhring	Delta-R corrections for marine shell dates in New Zealand archaeology - a regional perspective. Fiona Petchey	Retracing our footsteps: archaeological processes in disaster response. Gwen Jackson	
2.40-3.00	Unveiling the Roman Countryside - A Combined Methodology to Map the Structure and Complexity of Rural Landscapes Gijs Tol	Interpreting maritime accounts of life in 16th and 17th century Oceania Nicholas Keenleyside	Palaeomagnetic dating of New Zealand archaeological sites Gillian Turner	Archaeological response to 2011 Canterbury earthquake series Nick Mainwaring	
3.00-3.20		Gifting, barter and theft: tracking cross cultural exchanges in nineteenth century British New Guinea Robin Torrence	C14 for CRM in NZ: Strategies for Chronology Building in New Zealand Simon Bickler	The Canterbury Pub with stables and a morgue out the back: the building of the Junction Hotel, High Street, Rangiora, New Zealand Patrick Harsveldt	
3.20-3.40	An Archaeological Imagination of Seascapes: The Human Perception and Experience of the Sea Anja Krieger	Vikings in a Sea of Islands: comparative archaeologies of voyaging and migration from Polynesia and the Northern world Neil Price	The inception and design of the Polynesian Origins Database (POD) for the integration of radiometric dates from archaeological sites across Oceania Richard Jennings	Earthquakes, re-instatement of watermarks and the archaeology at Moncks Cave Reserve, Redcliffs Jeremy Habberfield-Short	
3.40-4.00	Magical Mystery Tour: The Role of Island-scapes in Connectivity and Entanglement Louise A. Hitchcock	Discussion	Developing a settlement chronology for Ahuahu, New Zealand Simon Holdaway	Bipolar stone technology and early Polynesian innovation in New Zealand Dan Witter	
4.00-4.30		Afternoon tea			

Thursday 29 November 2018 continued				
	Theatre 098	OGGB3	OGGB4	OGGB5
4.30-5.30	(E-)scapes: The archaeology of scapes through time and space	Archaeology: telling our story	Archaeology and radiocarbon dating in Oceania	
4.30-4.50	Meta-scape and Power: Identity and Terrain in Minoan Crete Sam Crooks	The story of our teeth: Life history and age from tooth cementum microstructure Marija Edinborough	Leaving home: a Bayesian analysis of the final occupation and abandonment of Te Kainga Islet, Rakahanga Atoll Justin Cramb	
4.50-5.10	The city as a site: a broad analytical approach to the archaeology of nineteenth century Christchurch Jessie Garland	It's not always about telling our story: the making of meaning at the Sydney Conservatorium of Music archaeological site Caitlin Allen	New radiocarbon dates show complex flint-mining and stone quarrying practices in Britain occurred at a time of large- scale immigration from northwest Europe. Kevan Edinborough	
5.10-5.30		'Eureka! - We Have Found It!' (or at least we think we have ...) David Wilton		
5.45-7.00	AAA AGM – OGGB 5 NZAA members meeting – OGGB 3			

Friday 30 November 2018				
	Theatre 098	OGGB3	OGGB4	OGGB5
8.30-10.30	Past present and future maritime pathways	Australasian and Pacific Archaeology -new perspectives on disciplinary history	Advances in the Zooarchaeology of Oceania	Digital archaeology – computers for fieldwork, analysis, research and reports
8.30-8.50	Passive Remote Sensing Methods to Assess the Impact of Cyclones on Archaeological Features Peter J. Ross	Everything you thought you knew about the history of Australian Archaeology is Wrong Matthew Spriggs	Creation of an Osteological Cetacean Reference Manual Youri van den Hurk	Using Unmanned Aerial Vehicles to better understand archaeological landscapes Emma Beckett
8.50-9.10	Cook visits Ipihiri Bill Edwards	Deconstructing the “birth” of Australian indigenous archaeology: evaluating the impact of the non-Australian on John Mulvaney’s life works Tristen Jones	Examining spatial variability in the exploitation of Queensland’s prehistoric marine fishery: Current perspectives and future research objectives Ariana Lambrides	Burrowing into the data. A multi-scalar semi-automatic approach to detect archaeological structures in Airborne LIDAR data Ben Jones
9.10-9.30	A comparison of ship construction on the Australasian maritime frontiers 1792-1840. Matt Carter	From Shell Bed to Film Archive: revisiting archaeological investigations at Anbarra through collaborative archiving Betty Meehan	Rocky shores, mud, and mangroves: An assessment of Holocene economic intensification at the Yindayin (Endaen) rockshelter, Stanley Island Martin Wright	Finding missing pieces: Decoding late Holocene mobility from lithic scatters in the semi-arid margins of the central Australian deserts Ben Davies
9.30-9.50	Shipwright artistry: the examination of a nineteenth century English East Indiaman Kurt Bennett	Challenging theories of raw material value; a critique of the raw material value system Rebekah Hawkins	Ko tēhea momo mangō tēnei? Which shark is this?: Identifying shark species caught in pre-European New Zealand Robert Brassey	Title: New technologies for old: using 3D models to identify change in Indigenous Australian lithic reduction strategies Simon Wyatt-Spratt
9.50-10.10	Oops wrong harbour! Rediscovery of the <i>Daring</i> shipwreck (1865), Kaipara South Head, New Zealand Isaac McIvor	Confessions of a Contract Archaeologist John Coster	‘The pinnacle of satisfaction’: archaeological evidence for hākari (feasting) in pre-European Māori society Matthew Campbell	Managing Data and the Archaeology of Archaeology: a case study from Bahrain Claire Reeler
10.10-10.30	Riddle Resolved: An Archaeological Post-mortem of Submarine <i>AE1</i> James Hunter	Roger Green and his prehistoric sequence Harry Allen	Zooarchaeology by Mass Spectrometry in Oceania Mike Buckley	Archaeology near me? Using simple scripting to geolocate large catalogues of reports Nicholas Pitt
10.30-11.00	Morning tea			

Friday 30 November 2018 continued					
	Theatre 098	OGGB3	OGGB4	OGGB5	
11.00-1.00	Place Stories; archaeology - emotion – entanglement	Australasian and Pacific Archaeology -new perspectives on disciplinary history John Flenley: An appreciation of his contribution to Polynesian prehistory Pamela I. Chester	Advances in the Zooarchaeology of Oceania Re-Analysis of the 'Engraved' Diprotodon Tooth from Spring Creek (Victoria) Michelle C. Langley	Digital archaeology – computers for fieldwork, analysis, research and reports Shhh! It's a Secret: Present sensitive cultural asset data Fiona McConachie	
11.00-11.20		Have you checked your (quote) "Wife's suitability" for fieldwork? For a history of women in Pacific Archaeology Emilie Dotte-Sarout	Bird exploitation at a pre-European Maori cemetery, the NRD site, Auckland, New Zealand Stuart Hawkins	Potential Applications for 3D Modelling and Game Engine Development Environments in the HBIM Process and the Cultural Heritage Industry. Andrew Wilkinson	
11.20-11.40					
11.40-12.00	See below for full list of papers	'The home of the coconut palm': German-language speculations on the settlement history of the Pacific Hilary Howes	Hunter-gatherer economies along the Newcastle coastline: An analysis of a shell midden site from the Late Holocene. Birubi, New South Wales. Megan Sheppard Brennand	Archaeology of the lower Moorabool River valley, Victoria Kasey Robb	
12.00-12.20			Determining exploitation patterns of sacred animals in the Maya Classic Period in the site of Chinkihá, Chiapas, Mexico through the use of isotope analysis Coral Montero Lopez		
12.20-12.40			Otoliths of Oceania – past, present and future Morgan Disspain		
12.40-1.00			Ichthyoarchaeological Meta-analysis in Northern Aotearoa: Challenges, Pitfalls, and Golden Opportunities Reno Nims		
1.00-2.00	<p>Lunch</p> <p>AA Editorial Meeting – Case Room 2 National Archaeological Week Meeting – Case Room 3 ICOMOS NSCRAA Meeting – OGGB 3</p> <p>1.20 – 2.00 Taylor & Francis Workshop – How to Promote your Work – OGGB 5</p>				

Friday 30 November 2018 continued				
	Theatre 098	OGGB3	OGGB4	OGGB5
2.00-4.00		Pacific rock art research	Advances in the Zooarchaeology of Oceania	Student Papers Session
2.00-2.20		Australian Rock Art: history, conservation and Indigenous well-being Sally K. May	Experimental work in faunal taphonomy: analysing tooth-marks from the major Australian terrestrial carnivore taxa Loukas Koungoulos	Mechanising Fibre Production: The New Zealand Flax Mill Project Alana Kelly
2.20-2.40		Addressing Australian/South-East Asian culture contact through rock-art: a comparative attribute analysis of rock-art between Island South East Asia and The Kimberley, Western Australia Matthew Tetlaw	Analysis of butchery patterns on <i>Ovis aries</i> remains to determine dietary patterns of populations within Colonial Sydney Talia Green	Access, Procurement and Reduction: a comparative geochemical and technological investigation of obsidian from Houhora and Ahuahu, Northern New Zealand Rowan McBride
2.40-3.00		Preservation vs. Culture- A Locational Analysis of North Island Rock Art Patricia Pillay	Power in food on the maritime frontier: a zooarchaeology of enslaved pearl divers on Barrow Island, Western Australia Thomas Dooley	A Tale of Two Managed Landscapes: Using Anthracology to Compare Māori Plant Management between Coastal and Inland Plant Production Sites Nikole Wills
3.00-3.20		Palaeolithic rock art in Siberia? Irina A. Ponomareva	Mackays to PekaPeka Expressway: Faunal Remains From the Monitoring Phase Yolanda Vogel	A Geospatial Analysis of Mounds in Upolu, Western Samoa Hayley J Glover
3.20-3.40		History of Rock Art Historiography, The case of Northern New South Wales 1837-1922 Amir Moghadam	Ecological Characterisation of Modern Mammal Communities in Australia and its Paleoenvironmental Implications Nikita Coleshill	Porcellanite Procurement and Mobility in Murihiku India Gillespie
3.40-4.00		What do we know about Māori rock art? Gerard O'Regan		
4.00-5.15		Poster session and Afternoon tea		
5.15-5.30		Whakamutunga (session closing formality by Ngāti Whātua)		
7.00-12.00		Conference dinner and awards ceremony		

Place Stores Papers (6 minutes each)

Conversations

- Ken Mulvaney.** Tootsie and me [Video]
- Liam Brady.** Looking for a donkey: Country, health and rock art in northern Australia
- Annie Ross.** Gummingurru and Calga: Place narrative and cultural landscape management practice

Emotions / Experiential

- Geraldine Mate.** Super-positioning archaeology and experiences through time: Integrating diverse physical and experiential landscapes at Mount Shamrock
- Tom Sapienza.** Celebrating a tiny island
- Belinda Liebelt.** Traveling with the archive: Using objects to evoke Country in native title research

Imaginaries

- Darran Jordan.** If all the lost spaces of the world were really just one space, this is what it would look like...
- Kelly Wiltshire.** Beyond facts, figures and tables: Excavating the reality of archaeological practice through the written page
- Sven Ouzman.** Smelling the past, sensing the future: Letting an archaeological imagination run wild behind closed doors

Contemplations

- Peta Longhurst.** Encountering Quarantine
- Peter White.** Encountering stone tools
- Ursula Frederick.** Why oh, why o, WYO?

Transformations

- Kevin Jones.** Whāngārā mai Tawhiti (Whāngārā from afar), Paikea, James Cook
- Steve Brown.** Hands across the water: Insights from a dark place
- Jamie Fraser.** Heritage and politics in the Hindu Kush: Shifting place stories from the National Museum of Afghanistan

Abstracts



STUDENT



POSTER



STUDENT POSTER



Isotope Bioarchaeology: prehistoric and post-colonial research from Cape York, North QLD

Shaun Adams, *Australian Research Centre for Human Evolution, Griffith University (Student)*

Clarence Flinders, *Cape Melville, Flinders and Howick Islands Aboriginal Corporation*

Michael C Westaway, *Australian Research Centre for Human Evolution, Griffith University.*

Geochemical tracing has developed into a commonly employed analytical technique in bioarchaeology. High profile cases like those tracking the life of the 4000 year old Ice-Man Ötzi and King Richard III have pushed isotope chemistry into the public consciousness and resulted in a global increase within archaeological research. However, in Australia bioarchaeological isotope research has remained underutilised. Being complicated and expensive, requiring destructive testing of human remains and the added complexity of piecing together a meaningful narrative from small datasets has resulted in very few archaeological isotope studies since the first in 1984 (Hobson and Collier 1984). With consent and encouragement from Aboriginal communities in Cape York, north QLD we present Australia's first regional scale bioarchaeological isotope study. Utilising carbon, nitrogen, oxygen and strontium isotope ratios we obtained new insight into prehistoric and colonial period Indigenous mobility and subsistence patterns. Research with the Aba Wurria of the Flinders Islands shows complicated island mobility within Australia's Great Barrier Reef up to 500 years before European colonisation. Other research conducted with the Gkuthaarn and Kukatj of QLD's Gulf Plains dates to the period of early European settlement and provides important insight into mobility and the hardships suffered by many Aboriginal people through this tumultuous period. This research has also culminated in Australia's first region-wide

strontium isotope variability surface to assist Aboriginal communities in repatriating unprovenanced human remains held in institutions across the world.

Reference

Hobson, Keith and Stephen Collier 1984. Marine and terrestrial protein in Australian Aboriginal diets. *Current Anthropology*, 25(2): 238-240.



The archaeology of a Western Australian battlefield site from the South African War (1899-1902)

John A. Adeney, *University of Western Australia*

Numerous small poorly or unrecorded battles involving Australian and New Zealand Mounted Infantry units occurred during the South African War (1899-1902). Battlefield archaeology provides an opportunity to present a primary account of military encounters not otherwise recorded in history.

One such battle was the successful defence of what is became known as 'West Australia Hill' on 9 February 1900. The hill, south east of Colesberg, will be examined to determine firing locations, the role of artillery, and the routes used by the Boers to attempt to dislodge the West Australians from their defensive positions.

The site will be assessed archaeologically using GPS ground-truthed field survey and, for the first time, metal detecting, which requires a special permit under South African heritage law. This field data will be analysed via 'Battlefield Pattern Recognition' as pioneered at the Little Bighorn Battlefield Monument, Montana, USA, to understand how 30 West Australians were able to defend a small hill against as many as 400 Boers.

It's not always about telling our story: the making of meaning at the Sydney Conservatorium of Music archaeological site



Caitlin Allen, *The University of Sydney*

The in situ conservation and presentation of archaeological sites has been happening around the world for many years. But do archaeologists and other professionals who create these places really understand how people use them to make meaning of the past in their everyday lives and how the presence of in situ archaeology impacts people's experience of place? What are the public benefits that arise from these interactions and what impact might a better understanding of the experience of site users have on the future of this particular type of heritage management response?

My current research at The University of Sydney is focussing on precisely these questions, using interviews and survey work with heritage professionals and site users at a number of conserved and interpreted archaeological sites in Australia. This paper will focus on recently collected data from students, staff and visitors to the controversial Sydney Conservatorium of Music archaeological site, which has been yielding some surprising results.

Roger Green and his prehistoric sequence

Harry Allen, *University of Auckland*

In 1963, Roger Green published 'A review of the Prehistoric sequence in the Auckland Province', his Harvard PhD thesis. Jack Golson credited this paper with causing a 'remarkable change in the look of New Zealand prehistory'. This paper reviews Green's 'sequence' in terms of the models and theories contained within it and its subsequent impact on the understanding of the New Zealand past.



Can we date that? Development of a near-infrared screening tool for bones

Katy Anderson, *University of Waikato*

Jolyn Pan, *University of Waikato*

Fiona Petchey, *University of Waikato, ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Dale Fletcher, *University of Waikato*

Bone is widely used in archaeology for radiocarbon dating, DNA and stable isotope analysis. Prior to these analyses, the protein portion (collagen) of the bone is isolated, and a range of quality assurance tests undertaken to ensure the collagen is sufficiently well-preserved and free from contamination. However, few samples pass these tests because collagen preservation varies depending on burial conditions, local environment and age of the sample. This poster presents preliminary results of a study undertaken at Waikato University using state-of-the-art machine learning predictive models and Near Infrared (NIR) bone spectra to develop an inexpensive, rapid, non-destructive screening test for collagen.

Documenting skills, rewarding experience: towards accessibility and inclusivity within Australian archaeology and Cultural Heritage Management.

Australian National Committee for Archaeology Teaching and Learning

The participation in and practise of archaeology and heritage management is often limited to the purview of those qualified through tertiary institutions. However, this typical pathway fails to recognise the experience and knowledge held by those without tertiary qualifications currently working within the heritage sector, many of whom are many Traditional Owners. We present here an innovative approach to fostering greater inclusivity within archaeology and cultural heritage management within Australia. Modelled on the highly successful, UK-originating "Archaeological Skills Passport", we propose to implement an Australian version tailored to the requirements of the Australian context. The passport provides a means by which skills and experience can be formally captured, whether the individual be a student, practicing archaeologist, Traditional Owner or interested member of the public. In this way, the passport is for everyone, creating a common language which not only allows skills experience to be recorded equitably, but is also accessible beyond a formal tertiary setting at limited

to no cost. Through this initiative we aspire to create a forum for inclusion and accessibility into archaeology for all Australians.



Teaching and learning in Australian archaeology: developments in resolving the discord between education and industry

Australian National Committee for Archaeology Teaching and Learning

Within the profession of archaeology, teaching and learning has been a source of dissatisfaction centred on our supposed inability to train both well-rounded researchers and industry-ready professionals. In response, the Australian National Committee for Archaeology Teaching and Learning (ANCATL) was formed to address these concerns at a national level. Several initiatives have subsequently ensued, including the germinal work *By Degrees: Benchmarking archaeology degrees in Australian universities* (Beck and Clarke 2008), this year celebrating its tenth anniversary. The document aimed to 'define the range of knowledge, skills and understandings Honours graduates in archaeology can be expected to possess, and outlines potential employment areas' (Beck and Clarke 2008: v). This has been followed by a continuing longitudinal study profiling the archaeological profession within Australia (Mate and Ulm 2016; Ulm et al. 2005; 2013) that has continued to inform all areas of the profession, including identifying critical skills shortages at a national scale.

A significant goal of ANCATL continues to be the facilitation of discourse between education providers and the broader profession. Indeed, ANCATL originated in part from discussions at the 2001 conference of the Australian Archaeological Association, focussed on the industry-training nexus. We report here on new and ongoing initiatives aimed at building a stable learning ecosystem within the Australian context, aspiring to solidify strategic ongoing relationships between education providers, industry, government and the broader community. To this end ANCATL plans to introduce an Australian archaeological skills passport within the coming year, based on the highly successful UK model and incorporating specific skills identified through the longitudinal surveys. The passport provides

opportunity for the documentation of skills experience, presenting a way of focussing professional development to meet current skills shortages. Further, a critical outcome of the passport will be to facilitate non-traditional pathways into the discipline by capturing skills experience outside of taught environments. The passport will complement a fully revised and updated edition of the Benchmarking document, ensuring a link between experience requirements and taught content.

References

Beck, W. and Clarke, C. (2008). *By degrees: Benchmarking archaeology degrees in Australian universities*, Teaching and Learning Centre, University of New England, Armidale.

Mate, G. and Ulm, S. (2016). *Another Snapshot for the Album: Results from the 2015 Australian Archaeology in Profile Survey*. *Australian Archaeology*.

Ulm, S., Mate, G., Dalley, C. and Nichols, S. (2013). *A working profile: The changing face of professional archaeology in Australia*. *Australian Archaeology* 76: 34-43.

Ulm, S., Nichols, S. and Dalley, C. (2005). Mapping the shape of contemporary Australian archaeology: Implications for archaeology teaching and learning. *Australian Archaeology* 61: 11-23.

Operating a heritage restoration project as an economic entity.

Norcombe Barker, Larnach Castle Ltd

Larnach Castle was designed and detailed by architect R A Lawson arcitech for William James Moody Larnach and his family.

It is a Heritage New Zealand Historic Place Category 1 listing.

The castle was built in 1871 using a variety of rock types and timbers. The Larnach family had an incredible history with William Larnach being an important contributor to the development of Dunedin and Otago, including being a member of parliament for many years up to his committing suicide in parliament building in 1898.

The estate went through many owners after Larnach's death and became a ruin until we, the Barker family, bought it in 1967.

The Barkers have spent over 50 years restoring the castle to the point we now employ over 90 people in peak season and have approximately 130,000 guests as visitors. It is worth noting, to achieve this, we do not sell an old building, but stories about the founding of a country and the restoration project.

We work closely with Heritage New Zealand and have an agreed covenant over the property. We receive funding from them for some of the major projects.

This paper looks at the tension between managing the restoration of a highly significant heritage site and an economic entity which must make money and which is owned and operated by a privately-owned company. The compromises and priorities that effect the decision making that must be done to successfully operate this model are presented. In addition, the difficulties of managing such a large heritage site in an environment where local and central government owned heritage properties compete with privately owned heritage tourist properties are discussed. The castle shows that a privately owned large building restoration project which is also a tourist destination can work successfully and should be better supported at local government level, also in the same way that wildlife restoration and conservation projects could be.

Inclusion and Diversity in consulting archaeology: Why does it matter? What are the benefits? What are the challenges?

Vanessa Beasley, Jacobs Group

Andrew Wilkinson, Flinders University

This paper examines current research and trends in workplace inclusion and diversity programs in the broader community and how they can apply to consulting archaeology and professional archaeological services. The benefits to organisations and community of an inclusive and diverse environment have been well established with a correlation between inclusion and diversity and improved profitability, innovation and productivity. Archaeology draws on the methodology and techniques of many other disciplines, which nurtures a diverse and consequently holistic range of

specialists in archaeological practice. This diversity is attractive as a career due to the accommodation of specific interests and variety of capabilities. In addition, archaeology in practice is not simply limited to potential employment, but also yields a unique potential mutual benefit to the community through the educational outcomes found appealing to those with learning difficulties and excavation programs developed for physical and psychological therapy and rehabilitation. It is also broadly accepted that designing for accessibility benefits the rest of the population, and as archaeology readily tests and adopts emerging technologies the discipline is well placed to make the work environment more accessible for all. However, research indicates that professional employment in the field of archaeology is not as inclusive as it could or should be. This study seeks to understand the importance of inclusion and diversity in consulting and professional archaeological practice; how inclusion provides tangible benefits to professional archaeological services and the community; and what are the challenges to becoming a more inclusive and accessible occupation. Finally, this paper will review some successful examples of casting a more inclusive net within archaeological workplaces, and propose a number of strategies for development in this space to encourage further consideration.



Using Unmanned Aerial Vehicles to better understand archaeological landscapes

Emma Beckett, University of Western Australia

Aerial photography has a long history of use in archaeology and it has been used to capture images of sites since as early as 1888 (Schlitz 2004). This technology allows for a greater ability to view the full extent of archaeological remains for the purpose of mapping as well as showing the presence of elements not always visible from the ground. As Unmanned Aerial Vehicles (UAVs) increasingly become cheaper and more easily accessible, it raises the potential for this technology to become more widely adopted. This includes both photography of sites but also the digital reconstruction of the landscape surrounding these sites. This allows archaeologists to better visualise and reconstruct landscapes and in turn to have a better understanding of the environmental processes at work on archaeological sites.

I explore the use of aerial photography and photogrammetry as part of an analysis of stone arrangements on the Dampier Archipelago (Murujuga). Photographs taken by a UAV are used to create a Digital Elevation Model (DEM) of these features and their surrounds. These models can be used to explore the current form and extent of these features, as well as providing information on hydrological processes and sediment transport; observations that are relatively undetectable from the ground. This information allows for a deeper understanding of the current and past site formation processes at work in these landscapes and show how UAVs can prove to be a powerful tool in helping understand the palimpsests of environmental and archaeological processes at work on these sites.

Reference

Schlitz, M. 2004. A review of low-level aerial archaeology and its application in Australia. *Australian Archaeology*, 59: 51–58.

Reinterpretation of island landscapes: LiDAR reveals extensive anthropogenic modification of entire islands in the Vanuatu archipelago.

Stuart Bedford, *The Australian National University, Max Planck Institute for the Science of Human History*

Our understanding of Pacific Island landscapes is being transformed by access to recently generated LiDAR data. Although such data remains sparse and patchy across the region its value in revealing past human activity cannot be underestimated. Three islands in the Vanuatu archipelago have had limited survey but the data generated for Efate Island is quite spectacular. It radically changes perceptions of the Efate landscape and contributes to a range of debates including traditional Pacific Island food production, its surplus and sustainability, socio-political development, environmental change and depopulation.

Hawkes Bay silicified limestone artefacts: the role of replication and experiments in understanding hafted stone adze manufacture and use

Phillip Belcher, *Atea a Rangi Educational Trust*

This paper explores the making and use of silicified limestone adzes from southern Hawkes Bay by reporting on replication experiments that consider both manufacture and use. It addresses the influence of raw material properties for adze manufacture and describes the how the hafted tools performed in cutting totara for a traditional free standing ancestor sculpture.



Shipwright artistry: the examination of a nineteenth century English East Indiaman

Kurt Bennett, *Flinders University*

Edwin Fox, an English East Indiaman built in Calcutta in 1853 represents the only surviving example of its type and an example of how mid-nineteenth century colonial English merchant ships were constructed. This paper presents the author's PhD research and explores Edwin Fox combined with historical records to discuss ship design and construction. A range of methods have been employed during this investigation including, 3D laser scanning ship recording, dendrochronology, metal analysis and archival research to understand what influenced design and construction technologies relating to mid-nineteenth century English East India Company (EEIC) vessels. This presentation contributes to our understanding of English colonial merchant ship building practices during the later years of the EEIC and complements traditional nautical archaeology approaches to ship typology.

Approaching rock art from a feminist perspective

Maria Lillo Bernabeu, *Underground Overground Archaeology*

Archaeology studies the societies of the past through material culture, yet the knowledge constructed is often incomplete. Historians and archaeologists have focused their research on the technological and industrial progress associated with men, while the female input has been considered lower in significance and dismissed. Thus, the interpretation of the past is biased. And the study of prehistory is not an exception to that, influenced by the androcentric lens.

Androcentrism is noticeable, amongst other matters, in interpretations of the Levantine rock art, located on the eastern part of the Iberian Peninsula. Such art dates to the Neolithic, going back more than 6000 years, and is frequently defined as the art of hunters and warrior men. These were the predominant scenes painted in the caves, indicating the presumed importance of the male role. Women were scarcely represented, only in passive attitudes, vague activities or as a symbolic banner.

Using the archaeology of gender and the maintenance activities as categories of analysis, the biased knowledge can be surpassed. Indeed, women are represented in the Levantine art in a wider range of scenes than men, including the preparation or consumption of food, health, caring, maternity, education and other social and cultural activities like dancing. All these essential aspects of daily life were painted in the caves as well as the hunters and warriors, but have been silenced or just ignored. Looking at the art from a feminist perspective brings women and their practices to light, not only to claim their active role, but also to emphasize how the interactions between men and women are the core of any society.

C14 for CRM in NZ: Strategies for Chronology Building in New Zealand

Simon Bickler, *Bickler Consultants Ltd.*

Radiocarbon dating undertaken for CRM projects in Aotearoa/New Zealand is faced with challenges including the limited stratigraphy of many prehistoric sites, the range of suitable materials for dating, constrained budgets and a compressed time span of human occupation. This paper examines those challenges, exploring strategies for sample selection, analysis and interpretation in chronology building in Aotearoa. It demonstrates how such strategies are not only useful for dating archaeological sites, but also how the resulting information can be integrated into better explanations for understanding the archaeological landscapes both for archaeologists and other stakeholders. It argues for finding new ways to illustrate radiocarbon results and how a new NZ radiocarbon database for archaeological sites could be used for research and public outreach

Red earth of ‘The Block’, Takou, Whenua O Te Runanga O Ngati Rehia

Chris Booth, *sculptor*

Nora Rameka, *Ngati Rehia.*

If you scratch through the grass at ‘The Block’, whenua (homelands) of Te Runanga O Ngati Rehia, rich red earth radiates out at you. This is ‘old country’ who’s people are the kaitiaki (caretakers) of the great migratory Waka, Mataatua, said to be preserved in stone in the Takou River below. And it’s kokowai (red ochre) country! In fact the name Takou derives its name from a specific type of kokowai. However, was there kokowai of good enough quality to use as paint, and if so where exactly was it mined? And how extensive was the mine? Was it traded? Can one find examples of it on artefacts found in the region? Was it a prized cultural resource that profited and empowered these kaitiaki of old?

In a paddock long overlooked and grazed by cattle out the back of ‘The Block’, a story that germinated 61 years before, finally emerged this year. And, it just might answer some of these questions.

Re-connection with the kokowai artefacts within the Booth Whānau collection recently accessioned into Te Kongahu Museum of Waitangi triggered the recollection of a conversation made at Takou Bay 61 years before. This recollection lead to the recent rediscovery of the kokowai pit site.

‘The Block’ surely must have once been famous for its high quality kokowai (red ochre), as the half hectare extent of this recently rediscovered intensive and extensive mine site poses.

Kokowai (red ochre) was widely used by pre-Contact Maori, Aboriginal and Peoples of Oceania to adorn, decorate and preserve.

Explaining the unexpected: recent archaeological revelations from northern Aotearoa

John Booth, *Marine scientist, Russell*

Hugh Rihari, *Ariki Ngati Torehina, Kerikeri*

Te Warihi Hetaraka, *Tohunga Whakairo for Ngātiwai and Ngāpuhi, Whangare*

Significant breakthroughs in science occasionally come

about through stumbling upon the unexpected - leading to new insights and possibilities not to be dismissed lightly but instead considered judiciously. Mainly surface archaeological collections from 50 years ago at Paraenui, a small, open-coast, probably Late-period fishing encampment just north of the Bay of Islands, contained two unexpected groups of artefacts. First, there were significant numbers (>30, four with lashing grooves) of spines of the northern spiny dogfish *Squalus griffini*, a shark essentially unknown from depths <100 m. These suggest that almost certainly there was fishing at and beyond 100 m depth, and at least 8 km from shore; indeed, local traditional accounts are rich with such sortieing. Second, among many large fishhooks, there was strong representation of small shell hooks (<25 mm high, usually one-piece), which appeared out of place in an open-coast setting with extensive reefs holding any number of large food-fish. We argue that a primary inshore focus was the leatherjacket *Meuschenia scaber* because its skin - and that of sharks - was used in the north as surrogate sandpaper in the fine-finishing of wood, shell and bone items. Overly speculative? Paraphrasing Green (1963), we must have hypotheses if we are ever to determine the facts which serve to contradict them. But the oral evidence of tangatawhenua is the trump card.



Korero around sources of obsidian artefacts found in the Bay of Islands and other parts of Northland

Webber Booth, *Independent researcher*

John Booth, *Te Rawhiti*

Andy McAlister, *University of Auckland*

Arana Rewha, *Te Rawhiti*

Our geochemical analysis of obsidian from the Booth Whanau Collection at Te Kōngahu Museum of Waitangi, together with obsidian examined from other assemblages, points to the Bay of Islands being a nexus: it is the northernmost part of the supply-zone of Huruiki obsidian; it is towards the south of the supply-zone of Pungaere obsidian; and it is within the contact zone for Mayor Island as well as several other southern

obsidian sources. In addition to long-term occupation, it is possible Whiorau Bay was an early stop-off point for voyaging waka, the embayment being close to open waters yet offering shelter, freshwater and - in particular - easily obtained shellfish. Perhaps it is not surprising, therefore, that this locality had the greatest variety of obsidian sources.

Looking for a donkey: Country, health and rock art in northern Australia

Liam M. Brady, *Monash University*

As part of my research, I have been privileged to listen to Yanyuwa men and women describe their relationships to the places we visited and recorded - a process that has, at times challenged my understanding of the role and value of archaeology in Indigenous contexts. My departure point to explore this reflexive process is a series of encounters with what are routinely described as 'rock art sites'. Yet, this label can often draw attention away from the social and cultural value these places hold especially when Yanyuwa embed sites and motifs into conversations emphasizing the health of people and country.

Tweetable summary: A reflexive journey exploring the complex relationship between place (Country), rock art and health in the southwest Gulf of Carpentaria

Using matrix matched calibrations for archaeological research

Christabel Brand, *Portable Analysers Australia*
Alana Pengilley, *University of Sydney*

Recent advances in both instrumentation and software programs have made portable X-Ray fluorescence (pXRF) analysers increasingly user friendly, which has increased opportunities within research.

Our talk will be focused on the use of the creation of a matrix-matched calibration for the analysis of volcanic stone axes from Papua New Guinea (PNG) at the Australian Museum, using basalt samples. This calibration will serve as an example of the improvements in pXRF technology. Over the past ten years portable XRF analysers have been widely used within archaeological research with varying success. During this time, issues with usability of both the instrument and the accompanying software have resulted in this technology not consistently being used to its full capability.

With this past in mind, this paper will examine the advantages and pitfalls of creating calibrations for these artefacts. We will also discuss alternative techniques that can be used in the matching of the axes and adzes with the place of manufacture, before looking at the possibilities of sharing pXRF data in the future.

Ko tēhea momo mangō tēnei? Which shark is this?: Identifying shark species caught in pre-European New Zealand

Robert Brassey, *Auckland Council*
Matthew Campbell, *CFG Heritage Ltd*

Sharks (mangō) and other Chondrichthyes were an important source of food and other resources for Māori as descriptions by explorers and ethnographers during the historic period make clear. As shark remains are not commonly recovered from archaeological contexts, understanding the nature and extent of shark fisheries during the early historic period can potentially provide a valuable insight into shark fishing and the biogeography of shark populations during the pre-European period. Identifying the species that were caught can be challenging due to the limitations of ethnohistorical sources, while the absence of a methodology for identifying shark remains to species level has restricted what can be learnt from archaeological assemblages. We adopt a multi-faceted approach based on an analysis of recorded observations from the historic era, and demonstrate that that shark species can be identified from vertebral discs and other surviving elements. We compare the conclusions reached from the historical record with the results of an analysis of a large assemblage of shark remains recovered from a 16th–17th century burial site from Manukau, Auckland (the NRD site, R11/859).

Hands across the water: insights from a dark place

Steve Brown, *The University of Sydney*

It was an incredible moment when torch light illuminated red ochre hand-stencils within Ballawinne, a limestone cave in southwest Tasmania. It is likely that I was the first non-Indigenous person to ever see the stencils, markers of a subterranean and deep time Aboriginal presence. What at that time seemed like a momentous

‘discovery’, subsequently has led me to question what happened in that pivotal moment, that palimpsest. What were the political and social structures within Australian archaeology in 1986 that enabled a white male archaeologist to enter this significant place and claim it as Australia’s patrimony?

Tweetable summary: When archaeologists record Indigenous ‘sites’ they are consciously or inadvertently claiming them as Australia’s patrimony. Am I bovered?

Life and Death on the Otago Frontier: A bioarchaeological study of Otago European and Chinese Gold miners and early settlers

Hallie Buckley, *Department of Anatomy, University of Otago*

Peter Petchey, *Department of Anthropology and Archaeology, University of Otago*

Lisa Matisoo-Smith, *Department of Anatomy, University of Otago*

Michael Knapp, *Department of Anatomy, University of Otago*

Rebecca Kinaston, *Department of Anatomy, University of Otago*

Jonny Geber, *Department of Anatomy, University of Otago*

Charlotte King, *Department of Anatomy, University of Otago*

Rachel Scott, *Department of Anatomy, University of Otago*

Anne Marie Sohler-Snoddy, *Department of Anatomy, University of Otago*

Population mobility transformed the ancient world and continues to shape modern societies around the globe. In the 18th and 19th centuries numerous diasporas flowed from the Old World to the New World, one lure being the series of international gold rushes that included California (1840s), Victoria (1850s), and New Zealand (NZ) (1860s). Each ‘rush’ involved the migration of thousands of miners whose common goal was rapid financial gain, the development of other industries and farming that formed the basis of many modern communities. While there is a vast literature on goldfields history documenting the social and environmental hardships of mining life, these historical sources are often silent on the role played by the inarticulate: women, children, the sick and the disenfranchised. The archaeology of goldfields in New

Zealand is extensive, but individual agency is hard to determine and the distinct cultural identity of individuals is often masked by a common artefact assemblage. Few aspects of miner's health have been examined archaeologically and the record is largely silent on the women and children whose health and survival is most affected by adverse conditions. Bioarchaeological research, the analysis of human skeletal remains from archaeological contexts, is able to add direct evidence to the individual narrative that is lacking through either historical or archaeology enquiry alone. Since 2016 we have excavated unmarked graves in four Otago Historic cemeteries, yielding a sample of nearly 40 individuals of British, mainland European and Chinese descent, each with a fascinating story to tell. This paper will outline the bioarchaeological health findings to date, focussing on the biological life histories of these early non-Maori immigrants and their descendants.

Zooarchaeology by Mass Spectrometry in Oceania

Mike Buckley, *The University of Manchester*

Biomolecular sciences have now been an integral part of zooarchaeological practice for several decades but remains dominated by DNA or lipid analysis, to the exclusion of isotopic analyses derived from proteins. However, a little over a decade ago, a method of species identification by fingerprinting the enzymatically cleaved fragments of the protein collagen was created known as ZooMS, short for 'Zooarchaeology by Mass Spectrometry'. Yet for most of this time, despite method development towards the ability to analyse large numbers of specimens, and from a much wider range of taxa, very little research has applied this technique to assemblages from Oceania. This presentation highlights a few such examples, particularly focussing on megafaunal assemblages from Australia dominated by the extinct short-faced kangaroo, but will also include insights into the challenges with working on collagen from species that are greatly distinct from those studied previously.



The archaeology of trans-Pacific interactions. Cultural transmission between Polynesia and South America. An update on recent research in Chile

Karolyn Buhring, *University of Auckland*

The possibility of contacts between Polynesia and the Americas has been considered by scholars since at least the 1920's. Today, there is no doubt that Polynesians made pre-Columbian landfalls in the Americas and there is strong evidence (e.g. Ballard *et al.* 2005, Clarke *et al.* 2006, Green 2005, Hather and Kirch 1991, Roullier *et al.* 2013, Scaglione 2005, Storey *et al.* 2007, Storey *et al.* 2011) with demonstrable significant cultural influences in Polynesia albeit principally focused on the movement of subsistence items. Chile has been identified as a potential focus of contact with Polynesia based on biological evidence and cultural parallels in material culture and linguistics. The Chilean evidence includes DNA evidence of prehistoric chicken remains with links to remains found in Polynesia, morphometric analysis of human remains showing Polynesian features, similarities in material culture including stone artefacts and marine technology and linguistics (e.g. Matisoo-Smith 2011, Matisoo-Smith and Ramirez 2010, Jones 2011, Ramirez 1990, 2011, Storey *et al.* 2007, 2011). Despite the growing research on this topic, there are many unanswered questions around the timing, regularity, duration and the overall magnitude and effect of such contacts. This paper presents an update on recent research on material culture from Polynesia and Chile which has focused on the study of cultural transmission through the use of cladistic analysis and geochemical methods. In addition, we report on the preliminary results of an archaeological excavation and chronological re-evaluation of the Arenal 1 site, the only site in South America that has provided direct evidence of Polynesian contact.

Triangular men on a very long journey (again): long distance voyaging and Hawaiian interactions in petroglyphic rock art of Tonga

David Burley, *Department of Archaeology, Simon Fraser University*

Shane Egan, *Tongan Heritage Society, Tongatapu, Tonga*

Geoff Clark, *College of Asia and the Pacific, Australian National University*

On Foa Island in Tonga in 2008, we recorded a petroglyph site with numerous open bodied triangular anthropomorphs, dogs, human feet intaglio, cupules as well as a turtle, lizard and other forms. The Foa imagery is

indistinguishable from that of Hawaii. Without precedent in Tongan rock art, we have interpreted this as evidence for 14th to 15th century Hawaiian/Tongan interaction. The Foa island rock art chronicle was published in the *Journal of the Polynesian Society* in 2009. Subsequently, additional imagery and contextual data have been recorded. We update the story of triangular men on a very long journey in the paper to be presented, and we re-examine its potential implications for long distance inter-island voyaging in the pre-European contact era.

‘The pinnacle of satisfaction’: archaeological evidence for *hākari* (feasting) in pre-European Māori society

Matthew Campbell, *CFG Heritage Ltd*

Hākari (feasts) were an essential component of pre-European Māori society. *Hākari* served to cement relationships within family and tribal groups, as a vehicle for competition between groups and to aggrandise elites. The prestige of elites was intimately linked to the prestige of the group and *hākari* were communally organised events where considerable quantities of food were gathered and stored for months ahead of time, prepared, and carefully displayed prior to consumption. They are well attested ethnographically but to date have received little attention from archaeologists. This paper begins by looking at ethnographic and historic evidence of *hākari*. It then examines several archaeological cases where an analysis of food remains where a consideration of their context indicates that they may be the remains of *hākari*, in particular a site containing two 17th century pre-European burial grounds and a late 19th century European-style cottage built and occupied by Māori, both in Auckland.



The Archaeology of the Portland Cement Works at Matakohe-Limestone Island 1895- 1915 - Visualising an Industrial Evolution

Jonathan Carpenter, *Friends of Matakohe-Limestone Island, Department of Archaeology and Natural History, Australian National University*

The historic cement works on Matakohe-Limestone Island in Whangarei Harbour is a palimpsest of structural

features, machinery, and landscape accretions and deletions, a remnant of decades of change and innovation, but also of catastrophe and opportunity, retirement and demolition, and biodiversity restoration.

In the last decades of the 19th century, vast technological change occurred in the cement manufacturing and allied industries. A relatively small-scale cottage industry of quarrymen and labourers producing batches of slacked and hydraulic lime and Roman cement in static kilns largely unchanged for hundreds of years was quickly replaced. Coal-fired and steam driven rotary kiln plant worth tens of thousands of pounds, overseen and directed by highly trained chemists and engineers, began producing cement in a continuous process developed by competing American and British industrialists. This is reflecting in the archaeological landscape of Limestone Island as the local works made the most of the opportunity provided by several disastrous fires to fast-follow international trends in cement production, with consequent effects on the social organisation of the cement works community.

Industrial landscapes can be difficult to map and display using traditional survey techniques and two-dimensional representations, and impossible to understand without consideration of the innovations in cement manufacture which occurred over the last decades of the 19th century and the first of the 20th. This poster presents the results of mapping and modelling the cement works at Matakohe-Limestone Island using aerial photogrammetry and terrestrial laser scanning and the interpretation of features based on historic sources for the island, and the history of innovation in cement manufacture internationally. As the elements have been teased out of the relic landscape, it becomes clear that what is visible now does not simply reflect the final stage of cement manufacture on the island, but is a result of two decades of near-constant technological and social evolution, and the increasing integration of what had been a small local industry with into a national and trans-national economic, scientific and industrial community.



A comparison of ship construction on the Australasian maritime frontiers 1792-1840.

Matt Carter, *La Trobe University*

Between 1792 and 1840, wooden sailing ships were built in increasing numbers throughout the maritime frontiers of Australasia. A statistical analysis of a sample of these ships has revealed a number of differences in the quantitative parameters of those vessels built in Australia compared to those in New Zealand. Additionally, the archaeological excavation of three pre-colonial New Zealand shipyards has provided insights into the operation of such industrial sites on the eastern side of the Tasman Sea. By combining the data from the statistical and archaeological analyses, theories are posited as to what factors influenced the construction of these vessels and what this can tell us about life during this formative period of our collective histories.

John Flenley: An appreciation of his contribution to Polynesian prehistory

Pamela I. Chester, *PIC Archaeology & Palynology*

Dr John Flenley, late Emeritus Professor at Massey University specialized in Quaternary vegetation history through palynology (the study of pollen and spores). John's contribution to the history of human-environment interactions in Polynesia is significant, with palynological research in New Zealand, Tonga, Marquesas Islands, Tahiti, Mangaia, and Easter Island.

John's academic career spanned more than four decades. He graduated from Cambridge University with an MA in natural sciences in 1962 and obtained a PhD in 1967 from the Australian National University with a pioneering vegetation history study in the highlands of New Guinea. He lectured at the University of Hull for 22 years, where he began his research on Easter Island. He came to New Zealand in 1989 as Professor of Geography at Massey University, Palmerston North. Here he set-up a state-of-the-art pollen laboratory, with a dedicated technician, and an adjacent microscope room. One of John's enduring research projects was developing an automated means of identifying palynomorphs. During his tenure he procured refrigerated storage for sediment cores and designed specialist coring equipment for the recovery of aDNA.

John based his conclusions on careful empirical research, and relentlessly pursued additional evidence and leading-edge techniques. He worked closely with archaeologists and specialists skilled in the identification

of other fossils. He investigated such issues as causes of deforestation, length of human settlement, accuracy of radiocarbon dating, and the sudden and sustained rise in the abundance of *Pteridium esculentum* in pollen diagrams throughout New Zealand at ~700 BP. Contentiously, he suggested that some at least of the earlier signs of vegetational disturbance might represent initial contact or small-scale settlements.

Amongst John's more distinguished achievements were editor of the *Journal of Biogeography*, Fellow of the Royal Society of New Zealand (2002), Doctor of Science from Cambridge University (2004), and Distinguished New Zealand Geographer (2015).

Petrographic analysis on Lapita pottery excavated on Vatcha, Ile des Pins, New Caledonia

Scarlett Chiu, *Institute of History and Philology, Academia Sinica*

Yuyin Su, *Institute of History and Philology, Academia Sinica*

David Killick, *School of Anthropology, University of Arizona*

Christophe Sand, *Institute of Archaeology of New Caledonia and the Pacific*

In this paper we will illustrate the number of possible pottery-making locations that we have identified so far from the Lapita pottery assemblages excavated from Vatcha, Ile des Pins, New Caledonia over the years. It has long been proposed that pottery unearthed at Vatcha were either made locally, or imported from, presumably, the southwestern Grande Terre. We first examined the non-plastic inclusions to determine whether minerals and rock fragments identified through petrographic microscope may occur naturally within a given geological region of New Caledonia, and use index minerals and rock fragments to separate various possible pottery production locations within such large geological regions. We then compare samples from multiple sites that have been assumed to be produced from the same location to determine whether there is a consistency in terms of temper types within a particular production location. We are able to identify multiple possible locations on both northern and southern Grande Terre for the 80 samples that we processed, but none from Ile des Pins. In this paper we will describe our methods to track possible

production locations for Vatcha Lapita pots, and will summarize different clay/temper mixture preferences observed in the samples.



Fun with bones and stones: Experimental animal butchery and bone working at UNE

Brooke Christensen, *Archaeology & Palaeoanthropology, University of New England*

Melanie Fillios, *Archaeology & Palaeoanthropology, University of New England*

Humans use animals for a variety of reasons – and for many of these uses, some type of mark often remains on the bones. Experimental (actualistic, replicative) studies are one way to better understand the taphonomic history of bone assemblages. Since archaeology studies the physical remains left behind by past cultures, learning to interpret these remains is one of the largest challenges archaeology students face. At UNE, many of these interpretive skills are taught from this processual framework. Several units across the Archaeology degree emphasize doing that thing which we are trying to understand – but how successful are they? How does actively replicating a behaviour inform our learning?

This poster presents the results of several actualistic faunal experiments drawn from two units at UNE – ARPA 307 Experimental Archaeology and ARPA 309 Zooarchaeology. These experiments aimed to better familiarize students with skeletal articulation, and to develop an understanding of some taphonomic variables resulting from human behaviour, such as butchery using stone tools, cooking and bone working. By actively disarticulating several animals with tools we made ourselves, we were able to better understand some of the physical and cognitive variables involved in subsistence strategies. While much of our learning is predicated on reading and observation, the physical process of butchery provided visceral, tangible insight into some of the qualitative decisions that underpin human carcass reduction and animal processing. Here we present an overview of the tasks completed and discuss the student experience of these tasks, with particular emphasis placed on the ways in which experimental experiences transform our learning.



Ecological characterisation of modern mammal communities in Australia and its paleoenvironmental implications

Nikita Coleshill, *The University of Queensland*

The majority of Australian megafauna (<45kg) went extinct in the Pleistocene and it has since been debated whether this was due to human arrival, or environmental shifts that fauna could not adapt to. Prior research relies on dating of megafaunal remains or isotopic analysis of sites, which has resulted in a national archaeological debate due to inconsistencies in results. This research contributes a new method of paleoenvironmental reconstruction via zooarchaeological remains. This analysis has been extensively used globally, most notably in Africa and Asia, however, it has never been applied in Australia. Fauna have morphological features adapted to their environmental niches, such as specialised teeth for grazing in grasslands, therefore habitat preference can be inferred from those features. Prior to making archaeological inferences, modern mammal communities are analysed to establish the key traits that can predict environmental preference. Based on previous African research, three key traits have been established as accurate predictors of environments: diet, locomotive regime and body mass. This research categorised the mammalian species from 54 national parks and nature reserves across Australia. Categories for the locomotion (e.g. terrestrial, arboreal), diet (e.g. browser, grazer) and body mass (e.g. 0-44g, 45-454g) were determined for 200 species present in the parks. Results show that body mass and dietary features have a strong correlation with environmental preferences. Therefore, these features can be used to infer habitat from remains recovered from sites. The application of this method to archaeological sites containing megafaunal remains will provide additional insight towards the debate, as the past environment can be inferred independently of both dating and isotope analyses.

Confessions of a Contract Archaeologist

John Coster, *Heritage Works, Tauranga*

New Zealand's 1974 legislation aimed specifically at the protection of archaeological sites has been in place for over 40 years. In that time, it has engendered a great

deal of archaeological recording and investigation, and some publication, but with little evaluation of the results or of the effects on the archaeological resource. Without detailed analysis and an accessible data set, we cannot know whether the legislation's ostensible aims are being achieved. This paper expands on that theme and calls for further research.



Leaving home: a Bayesian analysis of the final occupation and abandonment of Te Kainga Islet, Rakahanga Atoll

Justin Cramb, *University of Georgia*

The small seven-hectare islet of Te Kainga (literally: The Home) once held the only known pre-European contact village on Rakahanga Atoll, northern Cook Islands. Historic sources suggest that, before European contact, the village was regularly abandoned and reoccupied via a system of mass migration to the neighboring atoll – Manihiki. However, shortly following direct European contact (ca. AD 1850) the migrations ceased, and the village was moved to a much larger neighboring islet. Archaeological excavations on Te Kainga uncovered complex stratigraphic layering representing the final phase of the islet's occupation. However, radiocarbon assessments of the site have proven difficult due to a particularly problematic section of the SHCal 13 atmospheric radiocarbon calibration curve that affects many of the contact era sites in Oceania. Best practices were used in the recovery, selection, identification, and analysis of dateable materials on Te Kainga. In-situ carbonized botanical samples were collected from cultural strata and combustion features where possible, materials were identified to lowest possible taxa, and short-lived samples (e.g., coconut endocarp) were selected for dating. The resulting AMS dates were calibrated and modeled using OxCal 4.3. To overcome the problems posed by fluctuations in the calibration curve, the dates were constrained by stratigraphy and additional historically documented parameters (i.e., site abandonment). This resulted in a late precontact/contact era chronology divided by frequent stratigraphic breaks. This creates a unique temporal view of the processes of cyclical occupation and eventually terminal abandonment that defined the prehistory of this small

islet. In doing so, this study demonstrates one possible means of overcoming or reducing the problems associated with archaeological sites temporally situated on problematic sections of radiocarbon calibration curves.

Meta-scape and power: identity and terrain in Minoan Crete

Sam Crooks, *Department of Archaeology and History, La Trobe University*

Caroline Tully, *School of Historical and Philosophical Studies, University of Melbourne*

The island of Crete, located in the Mediterranean, is dominated topographically by mountainous terrain. Inhabited from the Neolithic, Crete was home to the Minoan civilisation which flourished during the Middle Bronze Age and reached its zenith during the Late Bronze Age. An aridity event around 2200/2000 BCE brought substantial change in climate coinciding with the appearance of cult sanctuaries on mountain peaks as herders and their flocks were forced upland for livestock subsistence. The deposits at such sites reflect pastoral and agrarian concerns and relate to health and fertility in livestock and humans. Mountains, it is argued, were instrumental to survival, functioning not only as a source of fresh water, but also providing pasture for grazing at a time when the Minoan culture was experiencing ecological challenges, and social and environmental change.

Close archaeological analysis of Minoan terrain, architecture, iconography and ritual practice demonstrates that the Minoans perceived a tripartite cosmological ontology founded in the natural world, and above all, oriented towards mountains. It will be argued that during the Cretan Neopalatial period (1750–1490 BCE) Minoan urban elites appropriated peak sanctuary cult and institutionalised this tripartite ontology. Manipulation of mountain symbolism became instrumental in the naturalisation of elite status and identity as Minoan elites positioned themselves as intermediaries between the populace and the (super) natural, and as the progenitors and arbiters of fertility and subsistence. Adopting the Peircean concept of replication, in which objects, places, and both built and natural forms are viewed as instantiations of social and cosmological ideals, the Minoan palaces themselves will be interpreted as sacred landscapes, instantiating the

cosmological axis mundi in which Minoan elites occupied a mountainous seat of power within a sacred urban and natural meta-scape. The (meta)physical terrain of Minoan Crete became a politicised, active agent in the enactment of power.

The emotional landscape of the Christchurch rebuild

Kathy Davidson, *Underground Overground Archaeology*

On 22 February 2011 at 12.51pm an earthquake, with its epicentre in Lyttelton and a magnitude of 6.3, struck Canterbury. One hundred and eighty-five people lost their lives as a result of the quake. While we now live in a time where we understand why natural disasters such as this happen, it does not make the loss of life and the destructive effect on the cities infrastructure and landscape any easier. Since nothing of this level of devastation had happened within New Zealand since the Hawke's Bay earthquake of 1931, how are we supposed to know how to deal with the situation? How do we as archaeologists deal with the moral obligation not to hinder emergency works, but also to record the history of the city for future generations? Here in Christchurch we have lived/are still living through this unique archaeological experience. One of the challenges that archaeologists face is to ascertain what should be done with the archaeological material, as a huge volume of archaeological data has been recorded over the past seven years.

This paper explores the changes within the landscape of Christchurch and how Cantabrians have expressed their emotions through the rebuild of the Garden City through the study of phenomenology (the study of consciousness and direct experiences) and taphonomy (the study of the formative and disturbance processes effecting the archaeological record).

Finding missing pieces: Decoding late Holocene mobility from lithic scatters in the semi-arid margins of the central Australian deserts

Ben Davies, *University of Auckland*
Simon Holdaway, *University of Auckland*
Patricia Fanning, *Macquarie University*

Surface lithic scatters are a common archaeological feature in Australian desert environments. The combination long-term occupation by stone-tool using groups and high visibility of distributions of artefacts invite considerations of settlement patterns in arid landscapes. Drawing on a case study from western New South Wales, situated at the margins of Australia's central deserts, we look at the process of accumulation in terms of the behavioural processes that generate them. Measures of occupation intensity such as artefact density, tool diversity, and geometric properties are used to characterise assemblages within the surface archaeological record, and computer simulations are used to demonstrate how variation in these measures is generated over time. We show that differences between assemblages within this landscape are largely a product time-dependent rather than behaviourally-dependent accumulation processes, reflecting a consistent pattern of lithic artefact use during the late Holocene. Ramifications for narratives of human occupation in the region, and the management of desert heritage landscapes, are discussed.



Experimental archaeology: student experiences and perspectives

Elanor DeGabriele, *University of New England*

Replicative studies are established as valuable research methods, with their value most useful when attempting to understand links between the dynamic processes of human behaviour, and the static archaeological record. Experimental studies are also beneficial due to their applicability with various material classes, as well as their suitability for examining issues from general ideas, to experiments with clear research designs. Furthermore, questions that can be addressed by these studies span a variety of spatial and temporal contexts. Despite the wide range of applications for replicative studies, their use is not reflected in the Oceanic region, with such studies more popular in Europe and North America. This is particularly true with regards to experimental teaching programs, which allow students the opportunity to carry out these activities. While there is much to be gained from these studies, and several tertiary institutions have incorporated experimental programs, there is not yet a developed understanding of the student experience when undertaking replicative work. Student insight and

perspectives can be valuable, fostering interest, and helping shape future work.

This presentation reviews student experiences and perspectives during the undertaking of replicative work at a unit undertaken at the University of New England. This program incorporated theoretical aspects, as well as a mandatory 4-day field school during which a number of experimental activities were carried out on materials including stone, bone, ceramics and organic material. These programs are valuable learning opportunities, and it is hoped presentations such as this, which are designed by students, and presented by a student, will help to form a community of interested experimental archaeology students, as well as provide future directions for institutions looking to incorporate similar programs.



**Doog (pound) girndi (*Vitex glabrata*).
Experimental archaeology and the
archaeobotanical record, Gooniyandi
Country, Western Australia**

India Ella Dilkes-Hal, *School of Social and Cultural
Studies, University of Western Australia*

June Davis, *Gooniyandi Traditional Owner*

Helen Malo, *Gooniyandi Traditional Owner*

The archaeological site Riwi is a limestone cave in south central Kimberley, Western Australia, situated on Gooniyandi ancestral lands. The Riwi archaeological sequence has yielded a range of *Vitex glabrata* (black plum) macrobotanical remains which are represented as whole fruits, whole and fragmented seeds, and a large number of sepals. Fruiting is restricted to the last months of the wet season (Jan-Feb) and historic accounts for Aboriginal groups across the Kimberley establish that during this time *V. glabrata* fruits are available in such abundance that surplus fruits were processed and stored, although these accounts lack detail about the processing sequence. In collaboration with senior female Gooniyandi traditional owners, June Davis and Helen Malo, we developed the Girndi Project to document step-by-step use of girndi; from locating trees, fruit collection, through to processing, storage, and consumption. Fruit processing experiments took place in both experiential and controlled settings. Comparison of the experimental remains and the archaeological fragments found in Riwi

suggest that the archaeological remains can be attributed to particular stages in the processing sequence. This suggests that sufficiently large quantities of girndi were gathered during seasonal occupations of Riwi and that fruit preparation for preservation occurred on-site. Our findings demonstrate that girndi fruit processing and storage were important socioeconomic activities carried out at Riwi in the past.

**Otoliths of Oceania – past, present and
future**

Morgan Disspain, *Everick Heritage Consultants Pty
Ltd/Southern Cross University*

Otoliths are small structures found in the inner ear of teleost fish that act as organs of equilibrium and as direction and sound detectors. They possess unique characteristics that set them apart from other skeletal structures, notably a continuous growth structure deposited daily. While otolith analyses are widely employed in modern fisheries studies, they have slowly been increasing within archaeological and palaeoenvironmental research. This paper overviews the development and prospects of otolith studies in archaeology in Oceania. The main methods of analysis are outlined and major advances and research in each area detailed. Despite some limitations, the benefits and unique information that otolith analyses can provide ensure that otoliths should be an important part of archaeological research. Continuing development of methods and technologies within this area will serve to further increase the importance and use of otoliths, while raising the profile of this unique resource.

**Pleistocene coastal occupation and
Holocene Islandisation: An example from
Barrow Island, North-Western Australia**

Kane Ditchfield, *The University of Western Australia*

Peter Veth, *The University of Western Australia*

Tiina Manne, *The University of Queensland*

Ingrid Ward, *The University of Western Australia*

Peter Kendrick, *Department of Parks and Wildlife*

Following the Last Glacial Maximum, sea levels rose dramatically around the world. In Australia, terminal Pleistocene sea level transgression drowned a large proportion of the continent's coast and created many

of the present-day islands. This paper addresses how Aboriginal people interacted with such dramatic and dynamic landscape change by examining one example of islandisation, Barrow Island in north-western Australia. Barrow Island preserves a coastal archaeological record from 50,000 years ago. It was part of the Australian mainland until approximately 7,000 years ago when rising sea levels severed it from the mainland. During this process Aboriginal people continued to occupy the island despite total decreasing resources as these were drowned across a diminishing landscape. Indeed, the island's Holocene archaeological record is diverse including dense terrestrial faunal, marine fauna and stone artefactual assemblages.

This paper will discuss the terminal Pleistocene – early Holocene terrestrial fauna and stone artefact assemblages in addition to the chronology and geoarchaeology of Barrow Island. The paper also serves as a context for the marine invertebrate assemblages which will be addressed separately. Ultimately, Barrow Island's archaeological record indicates that Aboriginal occupation was resilient to islandisation prior to abandonment.



Power in food on the maritime frontier: a zooarchaeology of enslaved pearl divers on Barrow Island, Western Australia

Thomas Dooley, *School of Social Sciences, University of Queensland*

The use of Aboriginal divers on the pearling luggers of late 19th century northwest Australia attracted allegations of slavery, coercion, and physical mistreatment. Historic accounts of the lives of these divers are limited to the allusions of colonial men, often far from the frontier. Likewise, archaeological assemblages that offer access to the experiences of these people are all but non-existent. In this presentation, I discuss the findings of zooarchaeological analyses of an offshore pearling camp, allowing a rare investigation of these divers. Taxonomic representation, body-part profiles, taphonomy, and spatial distribution demonstrate that multiple procurement, processing, consumption, and discard activities were undertaken at the site. Knapped glass artefacts and related cut marks on animal bones

establish that Aboriginal divers contributed to the processing and procurement of food resources. This, despite the fact that adequate rations of food were their only guaranteed form of payment. The occupation of this island camp may have allowed the colonial pearlers to conserve provisioned resources, utilising the divers' labour to produce their own rations. Equally, the faunal remains may reflect an opportunity seized by the divers to re-engage with knowledge, expertise, and traditional practices concerning the procurement and preparation of food. At Bandicoot Bay, food helped negotiate a labour relationship that was the culmination of a colony-wide project of disempowerment. Analysis of the remains of this food offers insight into how these processes may have been experienced on the maritime frontier.



What is the Role of Cultural Values in the Management and Protection of Heritage?

Nico Donovan-Pereira, *Maori Heritage Team, Heritage Unit, Auckland Council*

Ripeka Read, *Maori Heritage Team, Heritage Unit, Auckland Council*

Indigenous cultural values provide a way to communicate and exercise indigenous world views. Cultural values can play a vital role in the management and protection of heritage by articulating and identifying similarities of what is valued. Because of this, cultural values and indigenous knowledge can guide and inform the practice of western archaeology. Understanding the cultural values of a place unlocks the narratives and stories there, this allows for more appropriate management and protection. In order to understand the cultural values, there needs to be an acceptance of the differing world views and an indigenous perspective of heritage. Cultural values help to inform the narrative and landscape of a place, thereby informing the management of heritage and unlocking the past.

Identifying themes within a landscape allows a broad approach to the management of activities that align with beliefs and values of people in the past, present and future. The use of maps and tools is a double edged sword that may undermine or support indigenous heritage by the very nature of defining physical and mental spaces into 'meaningful places'.

This poster will explore the indigenous cultural values and how this may inform management approaches to heritage.

Have you checked your (quote) “Wife’s suitability” for fieldwork?

Emilie Dotte-Sarout, *School of Archaeology & Anthropology, The Australian National University*

Guillaume Molle (*School of Archaeology & Anthropology, The Australian National University*)

Hilary Howes, *School of Archaeology & Anthropology, The Australian National University*

Stephanie Cath-Garling, *La Trobe University*

For a history of women in Pacific Archaeology. Despite their absence from the official biographies and stories about archaeology in the Pacific, it appears that a number of women were highly involved in the development of the discipline in the region – from the late 19th to the mid-20th century. The superficial invisibility of female characters is of course a global pattern in history, and one especially striking in the history of science. To start addressing this issue, this paper will examine one specific trend in the history of women in Pacific archaeology: by using a number of case studies it will show how women’s presence and actions in the discipline evolved from the unpaid ‘voluntary’ assistant-wife of the recognised and official scientist to the professionally trained researcher, over the century when Pacific Archaeology emerged as a discipline. To better understand this history, we will be advocating for the development of a specific approach within the historiography of archaeology, using the conceptual tools already put in place by fields such as Women’s History and Gender Studies.

In this paper, we will argue, firstly, that women have indeed played an essential role in the history of our discipline; but, secondly, that to realise this, to investigate it and to properly understand why it has been unappreciated, the history of our science needs to be approached through a lens that allows for (i) historical and sociocultural gender construction/ gender identity mechanisms to be recognised, (ii) gender-biased records of history to be acknowledged, (iii) women’s rights in transnational historical contexts to be integrated in the analysis. By choosing a few biographical case-studies that span the late 19th to the mid-20th century period, we will examine how past and current gender prejudices

as well as sociocultural contexts have shaped the history of archaeology in the Pacific when it comes to women’s participation.



Orphaned girls and educated boys: class and gender in colonial Western Australian children’s institutions

Meg Drummond-Wilson, *University of Western Australia*

It has long been acknowledged within sociology and anthropology that socialisation and gender are irrevocably interwoven in the majority of human societies. The ‘childhood’ stage in a human life-cycle involves the transmission of societally-determined gender practices, divisions and roles to the young individual. This transmission of gendered knowledge and norms (which is not always accepted unquestioningly by the child) can be recognised archaeologically through material culture. The archaeologies of gender and of childhood are both relatively new sub-disciplines and often struggle with questions of how to ‘read’ these aspects from the material record. This presentation circumvents these struggles by examining the material culture of two nineteenth century specifically gendered childhood institutions – the Perth Girls’ Orphanage and the Old Perth Boys’ School. These sites were excavated by Perth-based consulting companies in recent years and I have conducted an ideological analysis of the material culture recovered as part of a 2018 Honours research project. The artefacts – which sit between a date range of 1854-1939 – are entered into a separate catalogue for each site, specifically designed to classify the artefacts according to formal, functional and ideological qualities. The research is then conducted through theoretically-informed qualitative and quantitative analysis, and aims to identify the complex ways that the child, the institution and the society navigated and managed gender through objects. This paper collates and assesses the findings of the research project and hopes to contribute to Western Australian historical archaeology with a robust analysis of the gendered experiences of the children who lived in and shaped our colonial past.

New radiocarbon dates show complex flint-mining and stone quarrying practices in Britain occurred at a time of large-scale immigration from northwest Europe.

Kevan Edinborough, *Institute of Archaeology, University College London*

Peter Schauer, *Institute of Archaeology, University College London*

Stephen Shennan, *Institute of Archaeology, University College London*

New radiocarbon dates suggest a simultaneous appearance of two technologically and geographically distinct axe production practices in Neolithic Britain, from igneous open air quarries in Great Langdale, Cumbria, and from chalk chert/flint mine shafts in southern England. Both are seen to start ~4000-3800 BCE. In light of the evidence that farming was introduced at this time by large-scale immigration from northwest Europe and that expansion within Britain was extremely rapid, we argue that this synchronicity reflects a knowledge of complex extraction processes and associated exchange networks already possessed by the immigrant groups, and the speed of colonisation as they moved away from the flint-bearing areas of southern England. Although we can model the start of these new mining activities, it remains harder to estimate how long significant production activity lasted at these key sites due to confounding site-formation issues.

The story of our teeth: Life history and age from tooth cementum microstructure

Marija Edinborough, *Melbourne Dental School, University of Melbourne*

Kevan Edinborough, *Institute of Archaeology, University College London*

The paper presents an example of successfully implemented outreach activities within our archaeological project under Marie Sokolowska Curie Actions, Horizon 2020 funded by European Commission. The two-year-project (2015-2017) was undertaken at the Institute of Archaeology, University College London (IoA UCL). The aim of the project was to develop and test a highly innovative analytical technique to establish fertility rates, life history events and ageing profiles within the context of their larger populations worldwide through time.

The integral part of the action was to design effective measures for the public communication and result dissemination of the research. To increase the project's impact within those terms, the action facilitated an integration of method and theory in resolving key questions in archaeology, by promoting multi-disciplinary exchanges in research and more operative communication: 1) With assistance of UCL IoA's professionals, a project web presentation was created, keeping in mind general audience's needs. The presentation was designed to facilitate outreach to educators and researchers at all levels from secondary schools to universities, as well as to scientific and popular media journalists; 2) During the action the researchers were engaged in a number of science promoting activities, such as outreach activities designed for the youngest public as well as for the local communities through voluntary work with UCL Outreach program; 3) The results dissemination involved scientific meetings and workshops, publishing in scientific journals, as well as collaboration with popular media.

The final positive evaluation of the measures implemented for the project's outreach was given by the European Commission, and it has been selected, among just a few others, to be presented on the Commission's Community Research and Development Service.

Cook visits Ipipiri

Bill Edwards, *Heritage New Zealand Pouhere Taonga*

Captain James Cook and his crew visited the Bay of Islands in New Zealand from 29 November to 5 December 1769. When multiple sources of information are integrated, the researcher is able to spatially locate the interactions that took place between the manuhiri (visitors -the Captain and the crew of the Endeavour) and tangata whenua (Ngāre Raumati).

By using the journals of Cook and his crew, the Pickersgill chart which shows the soundings from the small boats, archaeological site recording and oral histories we are able to build a model of interactions. This has been translated into a modern voyage in which people are able to visit these places by sea and debate the visit of Cook from the varied sources. This paper will discuss the methodology of exploring the past by using a seascape approach that has shed further insights into these early encounters.

Surveying multi-year excavations: Lessons from Ahuahu

Joshua Emmitt, *University of Auckland*

Matthew Barrett, *University of Auckland*

Patricia Pillay, *University of Auckland*

Rebecca Phillipps, *University of Auckland*

Since 2012 the University of Auckland and Auckland Museum have undertaken excavations tri-annually on Ahuahu Great Mercury Island. Excavation has been most intensive in the Waitapu area where excavations have occurred over eight periods of fieldwork since 2015. Artefacts, features, and trench boundaries are recorded in a geographic information system (GIS) with careful consideration of the x, y, and z coordinates. Trenches may be opened multiple times, extended over different periods of fieldwork, and new trenches opened in relation to old ones. On the dynamic coastal landscape of Ahuahu, which is also a working farm, this presents challenges as the spatial recording must be consistent across all three spatial axes over multiple periods of fieldwork. This is also important as a range of spatial data is incorporated into the GIS, and is used to inform further work. In this paper we present some of the challenges encountered recording geospatial data over multiple periods of fieldwork, solutions to some of the problems encountered, and lessons learnt along the way.

The creation of a 3D GIS from plan drawings of the Aboriginal Burial Ground at Roonka, South Australia

Joshua Emmitt, *University of Auckland*

Matthew Barrett, *University of Auckland*

Patricia Pillay, *University of Auckland*

Rebecca Phillipps, *University of Auckland*

Since 2012 the University of Auckland and Auckland Museum have undertaken excavations tri-annually on Ahuahu Great Mercury Island. Excavation has been most intensive in the Waitapu area where excavations have occurred over eight periods of fieldwork since 2015. Artefacts, features, and trench boundaries are recorded in a geographic information system (GIS) with careful consideration of the x, y, and z coordinates. Trenches may be opened multiple times, extended over different periods of fieldwork, and new trenches opened in relation to old ones. On the dynamic coastal landscape

of Ahuahu, which is also a working farm, this presents challenges as the spatial recording must be consistent across all three spatial axes over multiple periods of fieldwork. This is also important as a range of spatial data is incorporated into the GIS, and is used to inform further work. In this paper we present some of the challenges encountered recording geospatial data over multiple periods of fieldwork, solutions to some of the problems encountered, and lessons learnt along the way.

The Sheep's Back: A zooarchaeological approach to early colonial domestication, experimentation and innovation in Australia 1788-1840

Melanie Fillios, *The University of New England*

Sarah Ledogar, *The University of New England*

Sheep are the most iconic domesticate in Australia's recent past. As one of the founding species of the modern Australian economy, the sheep has played a critical role in Australian social, economic and political life – a continued importance poignantly underscored by the contentious issue of live exports. Yet the circumstances (and conventional accounts) surrounding the introduction, and subsequent rapid dissemination of sheep into the Australian landscape remains largely uncritically accepted.

This paper explores the zooarchaeological evidence for the intricate relationship between people and sheep that shaped not just the wool industry, but the nation's character and culture, placing the Australian economy on the world stage. In particular, we take a first look at the way in which sheep have altered both the physical and economic landscape of Australia. We highlight the significant gap in our knowledge of this early pivotal period of transformation in industry and culture, and discuss the need to explore this key animal as an integral step toward understanding the transformative relationship between people, animal domesticates and the environment in early Colonial Australia.

Who was Polynesian? Who was Melanesian? Identities and Ethnogenesis in the South Vanuatu Outliers

James L. Flexner, *Faculty of Arts and Social Sciences, The University of Sydney*

Frederique Valentin, *French National Centre for Scientific Research, France*

Stuart Bedford, *Archaeology and Natural History, The Australian National University*

Archaeological constructions of past identities often rely more or less explicitly on contemporary notions of culture and community in ways that can sometimes dangerously oversimplify the past and present. The archaeology of European colonialism has shown the proliferation of complex identities that emerged from recent cross-cultural encounters. We argue that this perspective can also inform interpretations of the deeper past, with specific reference to ongoing research in the Polynesian Outliers of Futuna and Aniwa, South Vanuatu. Polynesian Outliers represent precisely the kinds of cross-cultural spaces where complex identities likely emerged during the pre-European era. We outline a theoretical framework drawing on Actor-Network Theory and ethnogenetic theories that can be applied to Polynesian Outlier history.

Nga Taonga Tuku Iho me Nga Tapuwae

Xavier Forde, *Ngati Raukawa*

The existence of many wāhi tapu (sacred places) and other *taonga*, linked to ancestors and their occupation, is a powerful driver for continued *kaitiakitanga* over natural and cultural features of this island, regardless of government ownership. Altogether, the past imprinted on the land by ancestors meshed with the future potential for subsistence and self-determination is what provides a meaningful environment in which to live as Māori.

Te Waewae Kāpiti o Tara rāua ko Rangitāne is a 20 km² island just off the coast of Te Ika ā Māui in Aotearoa New Zealand. For centuries it was a plentiful source of food and a strategic defensive position for many Māori tribes, and is covered with ancestral and sacred places. At the time of European arrival in the early 19th century, it became a stronghold of the Ngāti Toa Rangatira tribe, who used it for as a base for conquest, trade, and whaling. The majority of the island was confiscated by the government from 1897 in order to create a bird

sanctuary. The northern end remained in the ownership of Māori, who have established a lodge and nature tours company. The Māori concept of *kaitiakitanga*, or traditional custodianship, is examined as a useful term to negotiate the tension between the protection of natural and cultural values on the island juxtaposed with nature tourism

Heritage and politics in the Hindu Kush: shifting place stories from the National Museum of Afghanistan

James Fraser, *Nicholson Museum, The University of Sydney*

In March 2001 Taliban policemen entered the Nation Museum of Afghanistan (NMA) and destroyed the few statues that had survived the looting of the Civil War. The infamous fate of the museum lent a certain cultural armour to Operation Enduring Freedom that saw allied troops in Afghanistan seven months later. I worked in the museum for six months in 2013-2014 as part of a Partnership Project between the NMA and the Oriental Institute in Chicago. In this paper I reflect upon the National Museum of Afghanistan as a mutable place within the realpolitik of the War on Terror, especially the well-told story of its phoenix-like rise from the ashes of the Taliban regime.

Tweetable summary: Reflections upon the Kabul Museum as a shifting place within political narratives

Why oh, why o, WYO?

Ursula K. Frederick, *The Australian National University*

Not much happens in Wyoming, or so it seems when you're passing through it. It's just a big blank square of rolling plains with the very occasional landmark. In fact, some of the most interesting places lie just outside the state perimeters, so that the journey to and from Wyoming is often more compelling than actually being there. That is, except for one stone monolith on an otherwise uneventful horizon. The Bear's Lair, or Devil's Tower as it is commonly known, grows up from the ground as you approach it like a magnificent sentinel. It puts the butte in beauty and it has captivated my heart and mind since I first saw it 40 years ago. In this short story I discuss how the Bear's Lair and Wyoming more generally, attuned me to archaeology

and guided my interest in how people make their worlds meaningful. I specifically address ideas of mark-making and mobilities, to explore the excursion archaeology unfolds rather than its destination.

Tweetable summary: A place can find its way into your being, and sometimes it takes time to realise it's there.



Representation of Tangata Whenua Cultural Heritage Places in the Dunedin Landscape

Jorge Fuenzalida, University of Otago

In many countries with a colonial-settler society, such as the United States, Canada, Australia, and New Zealand, difficulties emerge in how the cultural heritage places of multiple ethnicities are represented in the same landscape. In New Zealand it is assumed that this is the by-product of the British colonisation of the country in the early and 19th century. The city of Dunedin in the South Island presents a striking example of this, as despite the continuous occupation of the region by various Māori iwi across some 750 years, the city is represented by distinct Scottish and to a lesser extent English and Chinese cultural heritage places. The purpose of this research is to explore how cultural heritage places of the local iwi are represented in the Dunedin landscape and compare it to how European cultural heritage places have been represented. The aim of doing so is to compare how different ethnicities have different perceptions on what constitutes a cultural heritage place and how this has caused Dunedin to appear as a 'Scottish city'.



The city as a site: a broad analytical approach to the archaeology of nineteenth century Christchurch

Jessie Garland, La Trobe University

It has long been acknowledged that urban archaeology should involve "the archaeology of the city rather than just in the city" (Praetzellis and Praetzellis 2011), but it is not often that this has been extended to encompass

the archaeology of the city as a single site, in which the traditional analytical units of household, business or city block, exist as a network of interconnected features and deposits that can be analysed on multiple scales. In those cities where such an approach has been utilised, such as New York, San Francisco and Melbourne, this broad scale analytical framework has highlighted patterns of urban life and material culture use that remained invisible in smaller scale analyses (Rothschild and Wall 2014; Praetzellis and Praetzellis 2011; Lawrence and Davies 2018).

In Christchurch, the scale of the archaeological work carried out as a result of the 2010 and 2011 earthquakes has created the opportunity to apply a similar perspective in a New Zealand urban context. While it remains difficult to quantify the archaeological dataset collated in Christchurch since the earthquakes, current estimates suggest that approximately 2000 Māori and European archaeological sites have been recorded and between 150 000 and 200 000 European artefacts recovered from a wide range of site types, including domestic households, hotels, retail establishments, cottage industries, large industry, roading and sewerage infrastructure and religious sites. Such a variety of archaeological and historical contexts provides an unprecedented opportunity to investigate the changing availability and use of material culture within the city as whole, and to compare the results of that research to similar contexts within the archaeology of the British colonial empire. This presentation will provide preliminary observations on this research, which forms the basis of a PhD at La Trobe University, along with the challenges and advantages inherent in such large-scale analysis.



Porcellanite Procurement and Mobility in Murihiku

India Gillespie, The University of Otago

Lithic artefacts can provide invaluable information about cultural systems in the early human history of New Zealand. Porcellanite, a rock restricted to Murihiku (the areas south of the Rangitata River in Canterbury, including the Otago and Southland regions), was exploited as a resource by early Māori settlers. Porcellanite artefacts formed part of what has been referred to as 'The Southern Blade Industry', wherein new lithic resources, including

silcrete and cherts, were used to manufacture large blades dissimilar to other Polynesian lithics. Despite this, lithic procurement in Murihiku is largely underexplored. As part of this research, porcellanite procurement locations were visited to comprehensively survey the sites. Porcellanite procurement sites are often remote in relation to settlement sites and this raises questions of mobility and settlement patterns. This presentation will discuss the findings of the research, discussing how material occurs naturally, how it was procured or extracted, and to what level on-site manufacture was undertaken.



A geospatial analysis of mounds in Upolu, Western Samoa

Hayley J. Glover, *University of Auckland*

Thegn N. Ladefoged, *University of Auckland*

Ethan E. Cochran, *University of Auckland*

Stone and earthen mounds are amongst the most common type of archaeological feature found in Western Samoa, yet much of our knowledge surrounding the functions of these mounds is taken for granted. As such, this project attempts to examine a specific subset of these mounds in Upolu with the aim of explaining why mound-building behaviours persisted, despite being costly to build in many instances. The distributions of mounds are analysed within an evolutionary ecology paradigm, and costly signalling and bet-hedging are evaluated as potential explanations. The second aim of this research was to assess the utility of a semi-automated feature identification process, used to identify mounds within the landscape. A variation of a hydrological fill model was used for this, and a model of agricultural viability was produced for the island in order to evaluate the competing explanations of costly signalling and bet-hedging. A correlation of mound distribution with agriculturally viable land would suggest that costly signalling best explains the distribution of mounds, whilst a correlation with unproductive, variable areas would suggest that bet-hedging behaviours resulted in the distribution of mounds. Preliminary results of this analysis suggest that bet-hedging behaviours were not at play, and that costly-signalling may be a more likely explanation.



Investigation of Shell Bead Manufacture, Dampier Archipelago, north-western Australia

Wade Goldwyer, *University of Western Australia*

Fiona Hook, *University of Western Australia*
Joe Dortch, *University of Western Australia*

Shell beads are used as visual communication globally. In north-west Australia, long tubular mollusc shell (scaphopod) were chosen to make beaded necklaces since late Pleistocene. This paper identifies a scaphopod bead manufacturing site called Enderby 10, located in the middle of Enderby island, Dampier Archipelago, north-western Australia. The site also features rock art and evidence of Aboriginal occupation from 9,500 to 200 years ago. We attempted to identify the distinctions between naturally and culturally modified scaphopod shell fragments by comparing breakage patterns and use wear on Enderby 10 scaphopod fragments with historic and experimentally produced beads.

A total of five experimental techniques were tested which showed that each technique produced distinctive breakage patterns. This experiment was then compared to the archaeological collections, where the manufacturing technique used at Enderby 10 was determined.

We also speciated shell with reference to museum collections. The likelihood that Enderby 10 is a scaphopod bead manufacturing site is high. The scaphopod fragments consist mainly of posterior ends. A high proportion appear to have been deliberately snapped with a common breakage pattern, and they consist of a single species (*Laevidentium lubricatum*). These findings imply the site was not only a residential camp but a place for production of art and symbolic goods.



Relationships etched in stone: Sourcing the Caution Bay ground stone tool assemblage to examine the antiquity of exchange networks between the coast and lowland interior of the south coast of Papua New Guinea

Bradley Goodall, *University of Otago*

Anne Ford, *University of Otago*

Bruno David, *Monash University*

Ian J. McNiven, *Monash University*

Matthew Leavesley, *University of Papua New Guinea*

The Caution Bay site complex, 20 kilometres outside of Port Moresby, is one of the most significant newly discovered sites in the Pacific due in large part to the presence of Lapita sites, these being the first ever discovered on the south coast of Papua New Guinea. Here we examine the ground stone tool assemblage from sites dating to Lapita and post-Lapita time periods. The trading of adzes has been observed in the lowlands of Papua New Guinea both ethnographically and archaeologically to time periods dating back to 2000 BP (Rhodes and Mackenzie, 1991). However, in the lowlands there are relatively few fully ground stone tools from secure archaeological contexts from this time period, while examples from before 2000BP were non-existent prior to the excavations at Caution Bay. These sites then give us the best opportunity so far to examine the potential time depth of these exchange networks, as well as improve our overall knowledge of Lapita ground stone technology. This paper intends to present interim results on one aspect of the adzes; the processing and procurement of raw material, and what this means for understanding potential exchange networks.



The nature of interaction and mobility of the late Lapita site Amalut (FOL)

Arthur Grainger, *University of Otago*

My research is concerned with assessing the nature of mobility and interaction of Late Lapita societies observed through the ceramics of the Late Lapita site of Amalut

(FOL). Amalut is located on the mainland of southwest New Britain, just opposite the Arawe Islands. To date this assemblage has not been analysed.

The ceramic analysis will focus on decoration, form and production. This involves a detailed study of ceramic stylistic attributes (decoration and form) and a physico-chemical analysis of the ceramic matrix and non-plastic inclusions. This will involve the electron microscope. After a macro fabric analysis is undertaken using a low powered microscope on all sherds from Amalut, a sample representing ceramic fabric variability will be selected for microscopy.

The methodologies of this research follow Summerhayes (2000), which was an intensive study on Lapita mobility patterns and interaction in West New Britain. A major aim of this research is use the Amalut data to test the model that overtime mobile Lapita people became sedentary. That is, in Late Lapita assemblages as settlement becomes more sedentary, there is a reduction in production centres overtime as people select local materials over exotic ones. This reduction can be interpreted as a change in mobility patterns which was described above. The results from the stylistic analysis will be further used to refine the definition of Late Lapita dentate and incised decoration.

Reference

Summerhayes, G.R. 2000. Lapita Interaction. *Terra Australis* 15. ANH Publications & The Centre for Archaeological Research: The Australian National University: Canberra.



Analysis of butchery patterns on *Ovis aries* remains to determine dietary patterns of populations within Colonial Sydney

Talia Green, *Ecology and Heritage Partners, University of New England*

This research is an analytical study of faunal skeletal element profiles in order to gain conclusions on associated meat products available during Colonial times, and the relationship of these skeletal element profiles to socio-economic status and resource availability.

Reconstructing historical food and diet preferences is an integral part of understanding resource availability, socioeconomic status and ethnic food preferences through space and time. A significant amount of study has been undertaken on Colonial Australia in recent years, however; little research has focused on food and diet. This study analyses the butchery patterns on *Ovis aries* (sheep) remains excavated from Well 2, Allotment 21 at 163-165 Clarence Street and 304 Kent Street, Sydney, in order to determine the specific meat cuts that were being consumed, which meals these meat cuts are consistent with and the overall quality of diet in and around the Clarence Street area of Colonial Sydney. These findings are then applied to a comparative analysis of other faunal assemblages within the Sydney area and the wider landscape, which considers the impact of different ethnic influences, environmental pressures and geographical locations on resource availability and dietary preferences. This analysis has allowed for a reconstruction of dietary patterns and food preferences of the Colonial-era population in and around the Clarence Street area, and the determination of the socio-economic groups associated with the study assemblage.



Triggering Aboriginal cultural heritage assessments in property development in South East Queensland: the need for a proactive, not a reactive process

Kate Greenwood along with Kabi Kabi Traditional Owners, University of the Sunshine Coast and Greenwood Consultancy

Currently, the state of Aboriginal cultural heritage in South East Queensland (SEQ) is a mystery. In regards to archaeology and land-use planning, whether Aboriginal Cultural Heritage in SEQ is adequately protected or not, has not really been documented. Reporting systems such as the Queensland State of the Environment, only provide overall numbers of sites that are recorded on the Queensland Government cultural heritage database and do not include an audit of actual sites. It is not known if sites listed are intact, destroyed or effectively managed by the local Traditional Owners, landholders or governments. This is in stark contrast to historical (non-Indigenous) heritage, in which sites are mapped, audited regularly and funding is available to the community to

assist in management of the site. In terms of development, South-East Queensland is one of the biggest growth areas in the whole of Australia, yet there are little to no proper processes in planning schemes to afford protection or even assessment of Aboriginal Cultural Heritage sites for developments, unless they trigger an Environment Impact Statement (EIS). The lack of proper government processes and a reactive, not proactive legislative framework, has resulted in very little protection for Queensland's Indigenous cultural heritage. Combined with the fact that the *Aboriginal Cultural Heritage Act (QLD)* 2003 is triggered when the ground is disturbed and not in the planning stages of a development, and the lack of enforcement of the legislation on the ground, this has bred a culture of ignorance and avoidance within the development and planning industry. This has had drastic ramifications for South East Queensland's Traditional Owners' cultural heritage sites, rights of agency and inclusion in decision making processes on their lands. Case studies from Kabi Kabi Country, on the Sunshine Coast in South East Queensland will be discussed with Traditional Owners.



The State of Aboriginal Cultural Heritage in South East Queensland: an analysis of what is happening on the ground. (Poster)

Kate Greenwood

South East Queensland is one of the fastest growing population and housing development regions in Australia. However, Aboriginal cultural heritage legislation is not embedded into planning legislation and Aboriginal cultural heritage assessments are not required by local government planning schemes. This has led to many areas not being assessed for Aboriginal cultural heritage before a development occurs. If there is any Aboriginal cultural heritage assessment process, it is usually reactive and not proactive due to the legislation being triggered when the soil is disturbed and not in the planning stages of a development. A current Master of Arts research project is being undertaken at University of the Sunshine Coast of the Sunshine Coast, titled 'The State of Aboriginal Cultural Heritage in South East Queensland: an analysis of what is happening on the ground'. This poster outlines the background, methods and research questions behind this important body of work.



Florianthropes and Human-Environment Relationships: human-plant conflations in north-east Kimberley rock art, Western Australia

Emily Grey, *University of Western Australia, Kimberley Visions Research Project, Centre for Rock Art Research + Management, Balanggarra Aboriginal Corporation*

Finding evidence of past eco-practices and human-environment relationships in the Australian archaeological record is a tumultuous task. Natural processes of decay (taphonomic processes) automatically preference the preservation of lithics over organic materials. This leads to the development of biased theories regarding cultural eco-practices in Australia's deep past. Rock art is one of several ways we can sidestep the difficulties of the archaeological record and interpret past actions and material cultures. Human-plant conflations, known as florianthropes, are distinct rock art motifs unique to northern Australia; this research project focusses on those found in the Kimberley region of Western Australia. These motifs merge human and plant characteristics into a single concept of human identity. The study of Kimberley florianthropes and identification of represented plant genera can help us reveal culturally important plants, and understand why these plants became intermingled with human identity.

This research project uses archaeological data from the Kimberley Visions project at the University of Western Australia to identify florianthropes in north-east Kimberley. These motifs are analysed alongside ethnographic and palaeoenvironmental data to interpret florianthropes and contribute to the wider archaeological discussion on Australian Indigenous eco-practices in the Kimberley. Understanding these practices as unique cultural responses to a rich, diverse environment can reveal and reshape our understanding of how past Indigenous Australian groups have established themselves within the landscape, and how we as humans form our own understandings of identity.

Connecting language, places, stories, and archaeology for landscape-level heritage preservation: a case study of Eyak Lake, Alaska

David R. Guilfoyle, *Applied Archaeology International*

Jen Rose Smith, *Eyak Cultural Foundation*

Gary Holton, *University of Hawai'i*

Kathrin Kaiser, *University of Oregon*

Jenna May, *Eyak Cultural Foundation*

Genevieve Carey, *University of Montana*

Robert Bearheart, *Salish-Kootenai College*

Pam Smith, *Eyak Cultural Foundation*

Guillaume Leduey, *Linguist*

This paper explores a methodological process for documenting the intricate relationships between language, place names, stories, and cultural places for effective landscape heritage preservation. This multi-disciplinary program, led by the Eyak community, is focused on the analysis of place-based data and cultural knowledge systems, as the basis for protecting and mitigating the threats and impacts upon Eyak heritage and land; embedded within a broader program of language revitalization and community resilience. As a community initiative, it is the language learning process itself that directs the community-based research into the way place names and stories are organized and structured; as the method of revealing aspects of underlying knowledge systems and cultural principles embedded in landscape. When integrated with archaeological methods of regional study, the process also provides insights into patterns of traditional settlement and traditional management practices, and how they relate to these cultural systems, as layers within a cultural landscape. This methodological process outlined here is applied in an assessment of Eyak Lake - as a collaborative, strategic response to a range of direct and indirect threats to heritage places - including traditional burial grounds and salmon habitats - within this cultural landscape.

The Waikato Horticultural Complex: Aspects of the archaeology of intensified swidden horticulture.

Warren Gumbley, *The Australian National University*

The Waikato Horticultural System is the largest horticultural landscape in New Zealand and one its most intensive. Adaptation and intensification of archaeological systems has been a major theme in the study of the settlement of Polynesia as whole with a significant sub-theme being the transfer and adaptation of what might be called the Tropical Polynesian Horticultural System to the margins of Polynesia, including New Zealand. Over the last 10 years a considerable amount of archaeology has been undertaken on sites belonging to the Waikato Horticultural System with several well-preserved sites contributing valuable insights into the techniques applied and the processes followed. This presentation seeks to review these results and consider the implications of these for the understanding of the adaptation of a tropically oriented horticultural system to a temperate inland environment.

Earthquakes, re-instatement of watermains and the archaeology at Moncks Cave Reserve, Redcliffs

Jeremy Habberfield-Short, *Strata Heritage*

The 2011 Canterbury earthquakes critically affected the water main infrastructure in Redcliffs, such that the main pump station on Moncks Cave Reserve and water main pipes required replacement. An assessment prepared by Underground Overground Archaeology (UOA) determined that these activities had the potential to effect archaeological deposits associated with the Moncks Cave archaeological site (recorded as M36/47), one of the most important archaeological and cultural sites in New Zealand (Watson 2012). This work took place under Emergency Authority 2014/379eq.

This paper provides an overview of the results of the archaeological field work. It outlines new evidence for the presence of cultural deposits on the terrace immediately in front of the mouth of Moncks Cave which span a period from the time of Polynesian contact up to the migration southwards of ancestral of Ngai Tahu c. 17th century. As a direct result of the SCIRT water mains reinstatement

project (and the 2011 Canterbury Earthquakes!) there is now a new body of data spanning from the early 11th century to late 17th century AD from an area of the site hitherto unknown to exist. The results complement prior research and also contribute exciting new discoveries around the realms of chronology, contact and exploration, gender and technological development, subsistence patterns, and human-landscape relationships and interactions.

Maps, GIS and the inter-generational transfer of knowledge

Hauti Hākopa, *University of Otago*

Maps first captured the imagination of the Māori world when Northland (Tai Tokerau) ancestors Tuki and Ngāhuruhuru were kidnapped by Lieutenant Governor King of Norfolk Island in 1793. When asked about their country, they drew a map of Aotearoa on the floor of the ship with a piece of chalk. The distinctive rendering of the map was a reflection of the world from their perspective, what was important to them, from the worldview of Te Tai Tokerau. It is the same for other tribes around the country.

Maps for Māori are distinctively precious in their rendering of how they view the world. As such, they relate stories of who they are and how they connect to the lands of their ancestors. But well before 1793, Māori had a unique spatial awareness peculiar to them and their worldview; and Tuki's map is merely one example.

Chalk has since been replaced with more sophisticated tools (GIS) which insists that everything in the world can be constrained, reduced and cadastralised into points, lines and polygons. However, these tools lack a sense of, and sensitivity to, space, that locate Māori in the land based on their interpretation of time and space.

Points, lines and polygons only make sense when stitched together with the narrative. Let me walk you through the Māori worldview and give you a glimpse of the sophisticated oral tools that make sense of time, space and connect people to the land; and why this is important to inter-generational transfer of knowledge.

The Canterbury Pub with stables and a morgue out the back: the building recording & archaeology of the Junction Hotel, High Street, Rangiora, New Zealand.

Patrick Harsveldt, *WSP Opus Wellington*

The Junction Hotel, Rangiora, was opened in 1880 and was still in use as a pub until it was damaged in the Canterbury Earthquakes of 2010-2011. The 2-storey brick building was the second pub on the site, replacing the earlier timber building which was built in 1868. The ornate Oamaru stone façade originally featured an arched thoroughfare which allowed horse drawn carriages to access the rear of the property. Documentary evidence showed that the rear of the hotel was large enough for carriage parking, a stable building and a morgue. Numerous additions to the Junction Hotel had occurred over time which had extended the building to the rear of the property boundary. Archaeological investigations during demolition and rebuild works unearthed a stable floor and the potential location of the morgue building.



Challenging theories of raw material value; a critique of the raw material value system.

Rebekah Hawkins, *University of Sydney*

Research into stone as a raw material has led to specific notions of raw material value. A number of recent papers have highlighted issues with the current value associated with quartz. They call for the value of quartz to be reassessed based on a number of issues that cause bias against this material. Reflecting on these different attitudes, perhaps it is time to challenge archaeologists' theories towards quartz.

Reassessing the current raw material value system reveals traits that archaeologists use to determine value. This reassessment has identified two separate factors; knapping value and archaeological value. Knapping value is the value of the material to be worked and archaeological value is the value of the material to study. Archaeologists repeatedly determine the knapping value of raw material by the predictability of fracture and the extent of retouch. Quartz is prone to fragmentation and often lacks retouch.

The archaeological value is determined by the ease with which the material is studied, and the level of behaviour inferred from the material. Quartz is difficult to read and is often dismissed when inferring behaviour due to a number of issues. Consequently, quartz often obtains a low value. This presentation analyses and critiques the history and concept of raw material value. A revised raw material value system is proposed to reduce the biases and produce objective views of raw material. This new raw material value system was tested against a quartz dominated assemblage from Weereewaa, NSW (Australia). Results expose both a higher knapping value and higher archaeological value than previously assessed. Analysis revealed strategies employed to deal with the availability and abundance of quartz as well as other materials, allowing inferences on behaviour and highlighting the extensive knowledge of raw material properties.

Bird exploitation at a pre-European Maori cemetery, the NRD site, Auckland, New Zealand

Stuart Hawkins, *Australian National University*

Matthew Campbell, *CFG Heritage Ltd*

Beatrice Hudson, *University of Auckland*

Ethnographic accounts indicate that birds were important to Maori for subsistence as well as for feathers to make headdresses and cloaks during the contact period. They hunted birds seasonally using a sophisticated array of technology and techniques with a keen knowledge of the ecology of various habitats. Bird bones recovered from several prehistoric sites from the North and South Islands corroborates that birds were hunted in coastal, wetland, open grassland and forest environments throughout the prehistory of New Zealand, resulting in many extinctions soon after Maori arrived 700 BP. Excavations at the Auckland Airport NRD site in 2008-2009 revealed two 17th century AD burial grounds (urupa), from which 1915 bird bones were recovered and 28 avian taxa were identified. Using this data, we examine Maori bird hunting at the NRD site, as well as interpret the local environmental conditions of the period. Hunting was focused on medium sized taxa from four distinctive habitats of which the coastal and wetland habitats were most prominent in terms of both avian taxa represented and NISP. The open grassland habitat is also very well represented by NISP most of which are comprised of the New Zealand quail (*Coturnix novaezelandiae*) which

went extinct after European arrival during the late 19th century. Forest habitat representation is low indicating that forest environments may have been locally scarce. The representation of species indicates that the site was probably occupied all year round, with some species indicating significant summer occupation. Also some species, such as the white heron and the Australian hawk, were possibly hunted primarily for their feathers.

Pofatu: An open-access database for provenance analysis of stone tools in the Pacific.

Aymeric Hermann, *Max Planck Institute for the Science of Human History*

Robert Forkel, *Max Planck Institute for the Science of Human History*

Adam Powell, *Max Planck Institute for the Science of Human History*

Andrew McAlister, *University of Auckland*

Inter-community exchange and inter-island mobility was a decisive feature in the settlement of Pacific islands as well as in the evolution of Pacific island societies through time. Following the first attempts to infer inter-island interactions based on stylistic and typological similarities in material culture, petrography and geochemical analyses have been used to investigate the composition of artefacts in order to identify the natural origin of raw materials, and eventually reconstruct patterns of exchange between different localities, islands, and archipelagos. While these analyses are increasingly used to document elemental and isotopic compositions of geological sources and artefacts, a growing body of data must be used by researchers to better constrain the origin of new samples, and to reassess the provenance of assemblages previously studied.

In this paper we introduce Pofatu (Proto-Polynesian reconstruction for “stone”), the first online and open-access database of published geochemical data on stone artefacts and quarries in the Pacific. We will present the architecture of the database, which includes metadata related to archaeological provenance and chronological contexts of the artefacts, as well as method-specific metadata that relates to analytical procedures, accuracy and reproducibility of the measurements.

While most prehistoric quarries and surface procurement sources have yet to be identified, provenance studies must also rely on the acquisition of wide and reliable geological data related to the geological setting of each archipelago.

For this reason, we will show how Pofatu facilitates comparative analyses of geochemical compositions for archaeological and geological samples, through an access to a comprehensive collection of geological data available from the GeoRoc database (<http://georoc.mpch-mainz.gwdg.de/>) and the EarthChem portal (<http://www.earthchem.org/portal>). Ultimately, we will show how this integrated and exhaustive presentation of published archaeological and geological data will help in assigning reliable and unambiguous provenance to specific artefacts using a common reference dataset.



GIS as a tool for better informed heritage management

Greg Hil, *La Trobe University*

Effective Cultural Heritage Management (CHM) requires archaeologists to not only interrogate the past and the present, but also the future. This anticipatory perspective sets CHM apart from all other forms of archaeological practice. With a limited number of archaeological sites and building pressure from impacts such as development and climate change, there is a growing need for the archaeological record and management policies to be considered across broad spatiotemporal scales. Visualising and measuring landscape change through time is a task for which GIS is uniquely suited. Through the combination of national site registers and geospatial data such as LiDAR, Differential GPS, and georeferenced aerial imagery, GIS can enable archaeologists to both track and predict modifications to archaeological landscapes. This paper will demonstrate some of those capabilities through case studies, in which GIS is used to: 1) track rates of shoreline change along coastal archaeological sites in New Zealand; 2) model the potential impact of rising sea levels on those same archaeological sites by 2100; and 3) investigate how Victoria's gold mining boom in the nineteenth century altered the landscape and the implication of that for managing Aboriginal heritage. The multinational nature of these examples affords an opportunity to contrast management policy, while considering how GIS can drive better management of the archaeological record.

Magical mystery tour: the role of island-scapes in connectivity and entanglement

Louise A. Hitchcock, *University of Melbourne*
Aren M. Maeir, *Bar-Ilan University, Tel Aviv*

From an ecological standpoint, islands once held allure as imagined laboratories for the isolated study of social and cultural change. However, Horden and Purcell (*Corrupting Sea*: 76) have compellingly demonstrated that they were places of “strikingly enhanced interaction ... central to the history of the Mediterranean.” Although their detailed meta-history focuses on the historic periods, much of what they discuss can be identified in prehistory. This paper focuses on the unique role that island-scapes play in shrinking maritime space among the disparate cultures of the Mediterranean, bringing ancient west and east together through cultural and economic entanglement. From Sicily to Cyprus, like the *Magical Mystery Tour*, islands have got “everything you need,” because they were connected nodes in a globalized, unrestricted flow of people and goods, the ancient version of capital, where “satisfaction was guaranteed.”



Narrating Calga: archaeology, ethnohistory and Aboriginal knowledge

Sharon Hodgetts, *Forestry Corporation of NSW and Darkinjung Aboriginal Community*
Tracey Howie, *Guringai Tribal Link*
Associate Professor Annie Ross, *The University of Queensland*

Cultural landscapes are comprised of a number of elements, including tangible heritage places (sites), storyscapes, memoryscapes, taskscapes and journeyscapes. The Calga Aboriginal Cultural Landscape incorporates all these elements. In this paper we demonstrate the reification of theoretical aspects of cultural landscapes in a narrative of place that is informed by archaeological evidence and ethnohistorical records, underpinned by oral history and Aboriginal knowledge. We reveal how significance is constructed through the collaborative integration of scientific and Indigenous

Knowledge and establish the value of creating narratives of landscape that are more than the sum of the individual places protected by legislation.



Old pottery, new perspectives: Interpreting the Lapita settlement of Adwe (FOH) in the Arawe Islands, Papua New Guinea, through new pottery analyses

Nicholas W.S. Hogg, *Department of Anthropology and Archaeology, University of Otago*

Over sixty years of research has been applied to the Lapita phenomenon, which has led to the identification of over 250 sites spanning a vast distance of the Pacific. The oldest sites yet known from the Lapita range have deposits dating to between 3250-3150 cal. BP and are restricted to the Bismarck Archipelago of Papua New Guinea. These sites are very few with only 14 currently known. My current research focusses on the nature of interaction between these early communities by analysing Lapita assemblages from Anir, Emirau, Mussau and the Arawes. This presentation focuses upon one of these selected sites, Adwe (FOH) located in the Arawe Islands of New Britain, with particular emphasis on the pottery. This presentation builds upon earlier research by building a new motif database and integrating this with analyses of form and production data, and also the analysis and dating of new pottery assemblages from within Adwe. This body of information will be used to provide an updated occupational sequence for the site, and to further study the lives of the occupants as seen through the lens of their ceramic use and discard. Finally, the concept of the ‘house society’ will be employed as an interpretative framework from which to elaborate on the social and cultural lives of the people that called the settlement of Adwe home.

Developing a settlement chronology for Ahuahu, New Zealand

Simon Holdaway, *Department of Anthropology, University of Auckland*
Joshua Emmitt, *Department of Anthropology, University of Auckland*
Louise Furey, *Auckland War Memorial Museum*

Alex Jorgensen, *Department of Anthropology, University of Auckland*

Fiona Petchey, *University of Waikato, ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Rebecca Phillipps, *Department of Anthropology, University of Auckland*

Matthew Prebble, *Department of Archaeology & Natural History, The Australian National University*

Rod Wallace, *Department of Anthropology, University of Auckland*

Thegn Ladefoged, *Department of Anthropology, University of Auckland*

Ahuahu, Great Mercury Island lies off the eastern coast of the Coromandel Peninsula, New Zealand, and since 2012 has been the focus of intensive archaeological investigation. The island has archaeological deposits that span the entire period of human settlement of New Zealand. Here we report on a series of radiocarbon determinations derived from these investigations and their use to construct a settlement chronology for the island. We use determinations derived from both cultural and natural deposits, and from multiple locations, and use these to consider how a chronology might be constructed that focusses on the outcomes of human environmental interactions. By considering the nature of the samples selected for dating and the contexts from where these samples were obtained, we consider alternative approaches to the application of chronometric hygiene where some results are discarded in favour of others.



Aboriginal resilience and the role of marine invertebrates during the Holocene islandisation of Barrow Island, North-West Australia

Fiona Hook, *University of Western Australia*

Following the general results presented in the preceding paper by Ditchfield et al, this paper will discuss the early Holocene marine invertebrate record from both Barrow Island and the current mainland. During this period, as the climate ameliorated, the volume as well as the range of marine vertebrates and invertebrates eaten and used in Boodie Cave increased exponentially. However, once

Barrow Island formed around 7000 years ago, it was not revisited by Aboriginal people until the 1830s since the island now lay some 60km off the mainland coast. The descendants of those people who abandoned Barrow Island began to exploit the current Onslow and Cape Range coastline from 7000 years ago, continuing their maritime cultural practices until contact. The paper will explore the role of marine invertebrates in Aboriginal resilience during this period of major landscape and climate change.



The making of *Melo* spp. shell knives in northern Australia: A comparative study of archaeological, experimental and ethnographic data

Fiona Hook, *University of Western Australia*

Sean Ulm, *ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Kim Akerman, *University of Western Australia*

Richard Fullagar, *University of Wollongong*

This paper explores the archaeological evidence for the making of baler shell (*Melo* spp.) knives found in the late Pleistocene/early Holocene deposits in Boodie Cave on Barrow Island, northwest Western Australia. While such knives have been reported in surface midden contexts the archaeological signature of baler shell knife manufacture as not been described. This study aims to determine how the knives were made, characterise the manufacturing debris and investigate how they were used using three sets of data – Barrow Island knives, knives made by *Kaiadilt* people and experimentally made knives.

In the 1960s Tindale both filmed and collected knives and their manufacturing debris made by the *Kaiadilt* on Bentinck Island in the Gulf of Carpentaria. These knives and the manufacturing debris have been recorded and characterised. A series of knives were made using the ethnographically observed techniques and knowledge of shell breakage patterns. The experimentally made knives were then used to replicate usewear patterns. These data were then compared with the Boodie Cave knives. The experimentally made knives have been key to understanding manufacturing debris patterns, providing the basis for possible identification of shell knife manufacture in the Boodie Cave deposits where whole knives were not found.



How worn is worn? Late Pleistocene scaphopod shell beads from Boodie Cave, Barrow Island, north Western Australia

Fiona Hook, *University of Western Australia*

Scaphopod shell beads were recovered from the late Pleistocene units in Boodie Cave on Barrow Island during the 2013-2015 Barrow Island Archaeological Project excavations. Twelve of these beads were recovered in close association, possibly from a discarded string of beads from a necklace or bracelet. One of the beads has been directly dated to 10.8 cal BP with the other beads dating to between 22.5 and 6.7 cal BP. The beads exhibit small amounts of edge damage and wear indicating that they were strung and worn. When compared to beads from excavated contexts in the Kimberley, however, the Barrow Island beads show limited wear. In Australia, there is little research into scaphopod beads manufacture and use and the question as to how much the Barrow Island beads had been used can only be addressed through experimental archaeology.

This poster describes the wear on the Barrow Island scaphopod beads and compares that wear to experimentally made and worn scaphopod beads. The experimental bead sets were made using both archaeologically and Aboriginal ethnographically observed bead manufacture techniques. They were then strung on two different fibres in two different configurations. These were then agitated at set intervals and imaged under a microscope to determine how much polishing and edge damage is caused by stringing and wearing scaphopod shell beads.

'The home of the coconut palm': German-language speculations on the settlement history of the Pacific

Hilary Howes, *School of Archaeology & Anthropology, The Australian National University*

The Treaty of Versailles brought to an end Germany's brief period as a Pacific colonial power. Large-scale German expeditions to the Pacific virtually ceased after the First World War. However, the interwar period saw a proliferation of German-language theories about ancient Pacific migration routes and the settlement history of the region. German ethnologist Georg Friederici

published on Melanesian migration routes and posited a pre-Columbian discovery of America by Malayo-Polynesians, drawing particularly on the geographical distribution of the coconut palm, *Cocos nucifera*, and other plant species. Margarete Schurig, one of the first women to complete a doctorate in ethnology in the German-speaking lands, suggested in her dissertation *Die Südseetöpferei* (Pacific Pottery, 1930) that different pottery-making techniques in the Pacific could be used as a proxy for successive migration waves. Austrian-born ethnologist and archaeologist Robert von Heine-Geldern made stone tool typographies central to his endeavour to identify the original homeland of the Austronesians and trace their earliest migrations. His Swiss counterpart Felix Speiser attempted the still more ambitious task of writing a settlement history of the entire Pacific on the basis of material culture studies. I compare these German-speakers' speculations about ancient Pacific migrations, highlighting the influence on their theories of the intellectual contexts in which they worked and the types of evidence they privileged.



Variety and process: potential motion for New Zealand mortuary archaeology

Beatrice Hudson, *Department of Anthropology, University of Auckland*

Mobility is not necessarily restricted to the living; burial practices can involve ongoing stages of manipulation of remains, which render the deceased mobile long after death. The notion of burial as a process is currently being explored in bioarchaeology, particularly with the application of field anthropology. It is argued here that this perspective could be applied in New Zealand to enhance our currently limited understanding of ancient Māori burial rites and the social information they reveal.

Speaking from an archaeological perspective, there is a large gap in our understanding of ancient Māori burial practice. From New Zealand's scant published mortuary archaeology record, the general statement that emerges about pre-European Māori burial practice is: it varied. There are few examples of quantitative studies seeking pattern in or determinants of this variety and there has been very little synthesis.

There is now some developing potential to research this topic by working in strong collaboration with Māori and making use of the large body of grey literature burial reports that document hundreds of burials uncovered accidentally. These reports reveal evidence for complex and differential burial behaviour that was often an ongoing process involving re-visitation and removal of remains. In this way, mobility and social or spiritual roles appear to have continued after death.

But this is not a subject that can be considered only from an archaeological perspective. To research this very sensitive topic, Māori agency is necessary. Recent examples of collaborative research projects that have taken place in the South Island, the number of burial reports produced by working with Māori representatives in the upper North Island, and something of a resurgence of interest in practicing elements of traditional burial among Māori all point to potential for collaborative efforts to produce respectful research of benefit to Māori and the archaeological discipline.

Riddle resolved: an archaeological post-mortem of Submarine AE1

James Hunter, *Australian National Maritime Museum*
Irini Malliaros, *Silentworld Foundation*
Andrew Woods, *Curtin University*

The discovery of Australia's first submarine, HMAS AE1, in December 2017 solved the 103-year-old mystery surrounding its fate and the final resting place of its complement of Australian, British and New Zealander crewmen. However, questions remained regarding what caused it to sink in the first place, as well as the submarine's state of preservation and how it might be best managed in future. In early 2018, an opportunity arose to conduct a detailed, 3D photogrammetric survey of AE1. Because the site is located in over 300 metres of water, the survey had to be conducted using a remotely-operated vehicle and utilise camera equipment specially designed for use at great depth. This paper addresses AE1's history, the methodology and equipment used to locate the submarine, and follow-up efforts to document the site with still, video, and photogrammetric imagery. It also presents archaeological evidence of the catastrophic chain of events that resulted in the submarine's loss and Australia's and New Zealand's first wartime deaths at sea.

Ritual networks: an archaeological investigation of shrine architecture and ritual practice in the Solomon Islands

Jessie Hurford, *Department of Anthropology and Archaeology, University of Otago*

Archaeologically, the late pre-contact period of New Georgia (Western province, Solomon Islands) contains evidence of a distinctive cultural tradition, marked by the emergence of powerful headhunting chiefdoms, skull shrine architecture and ancestral cult assemblages. While thought to originate in the Western Province, many of these traditions were widespread throughout the Solomons at the time of European contact. Driven by theoretical questions of social interaction and transmission, this presentation examines key forms of mortuary architecture distributed throughout the Solomon Islands during the late pre-contact period. Here models derived from network theory are used to investigate the construction, arrangement and spread of specific types of architecture relating to burial and ancestor veneration. This study makes an important contribution to our understanding of ritual practice and associated shrine architecture in the Solomon Islands during the late pre-contact period.



South Australian Earth Mounds: An untapped resource

Sarah Hutchinson, *Flinders University, Koorana Aboriginal Community and Heritage Association*

Earth mounds are a well documented site type across Australia. However, their knowledge and research in South Australia has been sporadic and underrepresented in academia and national debates. Yet they can yield a wealth of information regarding subsistence variability and movement patterns.

Although earth mound reporting is extensive in South Australia and the Adelaide Plains area, their development, function and relationship needs further understanding as earth mounds have not been well researched in this area. Most earthen mound documentation has been generated through heritage reports with very little

research. There have only been two mound excavations in South Australia (Greenfields and Gillman Mounds), both located within the Adelaide Plains region and both because of mitigation works due to urban development. Whilst no longer physically present, the cultural material removed from the mounds can inform us of past lifeways. Unfortunately, detailed research has not been fully utilised beyond reporting of human remains. This also means that communities have not benefitted from any investigations as they have rarely gone beyond notations in reports.

Research into earthen mounds in South Australia is gaining traction through community collaboration with researchers at Flinders University. There is a current momentum in examining collections excavated some time ago to understand their meaning before too much context is lost through time.

One such project is on the Greenfields mound which provided evidence of faunal diversity which is currently the focus of doctoral research. This poster explores South Australian earth mounds and the beginning of that research.

Retracing our footsteps: archaeological processes in disaster response.

Gwen Jackson, *Heritage New Zealand*
Pouhere Taonga

Frank van der Heijden, *Heritage New Zealand*
Pouhere Taonga

Christine Whybrew, *Heritage New Zealand*
Pouhere Taonga

The Canterbury earthquakes have been a double-edged sword for archaeological work in Christchurch. The sheer number of archaeological investigations has raised public awareness of archaeology, multiplied the number of recorded sites in Christchurch, expanded our knowledge of the settlement's history, and created a boom in archaeological consultancy work. However, the quakes also triggered challenging variations to the archaeological laws that Heritage New Zealand Pouhere Taonga regulates. This presentation will outline the involvement of Heritage New Zealand in administering archaeological processes in the wake of the Canterbury earthquakes and provide some thoughts on responses to other Civil Defence emergencies declared since.

The inception and design of the Polynesian Origins Database (POD) for the integration of radiometric dates from archaeological sites across Oceania

Richard Jennings, *Research Centre in Evolutionary Anthropology and Palaeoecology, Liverpool John Moores University*

Hiba Alsmadi, *Department of Computer Science, Liverpool John Moores University*

Geoff Clark, *Archaeology and Natural History, The Australian National University*

Dhiya Al Jumeily, *Department of Computer Science, Liverpool John Moores University*

Fiona Petchey, *University of Waikato, ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Establishing an accurate chronology of the initial movement of peoples into Oceania and of their subsequent cultural transformations is problematic for a number of reasons. With so many Pacific Islands being archaeologically investigated over many decades by investigators from research institutions and heritage organisations across Australasia and beyond, one of the most significant issues we have is the lack of a uniform radiometric database for the region. Here we report on a project to design and populate a web-based geospatial database that will greatly facilitate the input, management and dissemination of radiocarbon and archaeological information from the Pacific region. Known as the Polynesian Origins Database (POD), it is built using Arches heritage management software and hosted by the Radiocarbon Dating Laboratory at the University of Waikato in partnership with Liverpool John Moores University, UK. Its development will enable disparate radiocarbon datasets to be integrated and standardised using the international heritage recording standards of the CIDOC CRM (Council of Museums Conceptual Reference Model). One key aspect of the database is its ability to store data concerning all aspects relevant to the generation of a radiometric date: e.g. its archaeological context, sample type, laboratory procedures, and the associated environmental evidence required to accurately interpret radiometric dates, such as reservoir effects on radiocarbon dates and ^{13}C data. We believe such an approach is needed as researchers will often take radiocarbon dates at face value and fail to understand how a date can be affected by these matters. To demonstrate how POD works, we present

data from the 2630-year-old late Lapita site of Talisu on Tongatapu, which includes a range of radiocarbon sample types (bone, charcoal and shell) and associated quality control information. Through this approach, we intend to address key research questions concerning Pacific Archaeology and also provide a database model that has global application.



Quarrying and Adze Manufacture at Bluff Harbour, Southland, New Zealand.

Chris Jennings, *University of Queensland*

Several locations throughout the Bluff Harbour area exhibit extensive outcrops of Bluff Argillite, an indurated metasediment used to produce adzes in the first few centuries of the Polynesian settlement of New Zealand. Bluff Argillite was used as the main raw material for a major operation of adze production in the Bluff Harbour area, and the resulting tools were distributed over much of the of the South Island. This paper explores quarrying and adze production activities in the harbour focusing on two key locations – Colyers Island and Tiwai Point. Colyers Island is the largest source of Bluff argillite, with archaeological material exposed throughout much of the intertidal zone. The current condition of the major sites on the island were recorded, and the largest quarrying area mapped. Tiwai Point was a multipurpose hunting and stone working site excavated in the late 1960s prior to the construction of the Tiwai Point Aluminium Smelter. 3D models of adzes, adze fragments, blanks and preforms from the Tiwai Point excavation were created and analysed to study strategies of raw material procurement in the harbour and adze manufacturing technology at the site. Both localities are considered in relation to current models for settlement in the Foveaux Strait area, with specific detail to the importance of Bluff argillite as an early stone resource driving activity in the region.



Drones and Contaminated Sites – Historical Investigations at the Ottery Tin and Arsenic Mine and Tent Hill Processing Area, NSW

Chris Jennings, *Virtus Heritage*

Mary-Jean Sutton, *Virtus Heritage*

Dan Tuck

The former Ottery tin and arsenic mine and the former Tent Hill processing area, NSW (in operation from 1882 until 1940) are managed by the NSW Department of Planning and Environment, Division of Resources and Geosciences, Legacy Mines Program (LMP). These sites have degraded due to the industrial processes that created them and require rehabilitation. The Ottery Mine is an expansive site that features several ruined mining structures and is considered a rare heritage resource, much of which is listed on the NSW state heritage register. The nearby Tent Hill site was a processing and tailings disposal site associated with Ottery. Virtus Heritage was engaged by GHD on behalf of LMP to prepare an Historic Heritage Assessment including a Statement of Heritage Impact in support of the remediation works at the two sites. Archival recording of the site features was undertaken by Dan Tuck with assistance from Chris Jennings in December 2017. The main Ottery buildings are largely in an unstable and partially collapsed state, and the brickwork associated with these structures is largely coated with dangerous arsenic compounds. Based on both chemical and physical safety risks, meant some features of the site were subject to very limited access for archival recording purposes. A drone (Unmanned Aerial Vehicle) was used to produce aerial photographs to create high resolution imagery to aid recording of contaminated features, and to provide photographs of features from elevated positions. At the Ottery and Tent Hill sites, drone-aided recording has proven to be incredibly useful tool in assisting archival recording of features at contaminated sites.

Burrowing into the data. A multi-scalar semi-automatic approach to detect archaeological structures in Airborne LiDAR data

Ben Jones, *Clough and Associates*

Simon H. Bickler, *Bickler Consultants Ltd.*

This paper builds upon the work of Jones and Bickler (2017), who examined the potential for LiDAR to assist in the recording and heritage management of archaeological sites in New Zealand. This paper demonstrates a multi-scalar approach targeting archaeological structures of varying size across a range of different topologies under variable vegetation types. The reasons for this work are that large areas of New Zealand remain under some form of dense vegetative coverage which may be difficult to access. These areas often contain archaeological sites that are difficult to locate and map in detail even when the archaeological features are large. LiDAR's advantage from an archaeological perspective is that the terrain models generated can be examined using semi-automatic and machine aided detection and be effective in locating and mapping such sites. The paper offers some case studies from the North Island showing how such techniques may be expanded to large regional survey.

Whāngārā mai Tawhiti (Whāngārā from afar), Paikea, James Cook

Kevin L. Jones, *Wellington*

My map of Whāngārā has the headland with the small kāinga (village), the marae Whitirēia and the mōtū (island) Te Ana o Paikea at centre. The viewpoint is from the south-east, from Te Moana a Kiwa (the Pacific Ocean) which here ranges all the way to the first-settled islands of Eastern Polynesia and as far as the Americas and Antarctica. Faa'a which is the north-western district of Tahiti is reflected 6,000 km distant and 800 years later in the name of Whāngārā mai Tawhiti. I can look down over the highest parts of the not very high land. Sandstone and hard mudstone ridges, some with ancient chert quarries, reticulate their way inland from the headland and from them to north and south mudstone slumps in great folds down to the Pākārae and Waiōmoko Rivers.

In 1984, in the course of recovering a surface scatter of chert flakes near a spring, we found a 1761 George III coronation medalet at Whāngārā. It was undoubtedly

gifted to iwi there by James Cook on the *Endeavour* on a particular day in 1769; It must have been discarded or lost soon after it was received by a chief descended from Paikea and remains the only archaeologically recovered object marking Cook's first-voyage visit to New Zealand. Can the medalet still be thought to represent a claim to or mark of British sovereignty over New Zealand, as was apparently the intent in 1761? What is it about this small, some might say unremarkable place, Whāngārā, that has made it, or could make it, part of the origin story of both iwi and pākeha in 21st Century New Zealand?

Tweetable summary: Whāngārā mai Tawhiti and Gable End Foreland? Good discovery makes good landscape.

Deconstructing the “birth” of Australian indigenous archaeology: evaluating the impact of the non-Australian on John Mulvaney's life works.

Tristen Jones, *School of Archaeology & Anthropology, The Australian National University*

John Mulvaney has popularly been called the 'Father of Australian archaeology' due to his pioneering excavations in the 1950s and 1960s that detailed for the first time the deep time indigenous occupation of Australia by Aboriginal peoples. Yet while being one of the earliest and arguably one of the most influential 'Australianist' archaeologists to date, Mulvaney's academic research activities were not limited to Australia alone, with his international activities guiding and influencing his Australian endeavours. Indeed Mulvaney's knowledge and understanding of Australian prehistory was greatly influenced by his interdisciplinary work as both a historian and an archaeologist and by both his mentors and colleagues, most of whom were not Australian focussed researchers. This presentation aims to deconstruct and evaluate the influence of the non-Australian on John Mulvaney's life works, in particular highlighting the impact of his formal international training, research and travel activities, in addition to the influence of his colleagues. The presentation aims to illuminate the diverse international interdisciplinary context of knowledge production in academia that Mulvaney was engaged within and influenced by, which ultimately culminated in what Tom Griffiths has coined 'Australia's 20th century archaeological revolution' (Griffiths 2011).

Lost Places

Darran Jordan, *AECOM Australia Pty Ltd*

The discovery of something lost is one of the recurring motifs of archaeology. The idea permeates popular culture representations of the discipline, from lost tombs to forgotten temples, drawing heavily on the romanticism of the treasure hunter era to infuse novels, films and interactive gaming. Independent of location, historical period or cultural association, the space of the lost place has developed its own characteristics. Just as Joseph Campbell drew commonalities from a comparison of different mythological stories from around the world, so can the shared elements of the lost space can be defined, understood and explored as one hypothetical location.

Tweetable summary: If all the lost spaces of the world were really just one space, this is what it would look like...

A history of Ngati Pukenga through pa

Des Kahotea, *Ngati Pukenga*

In the Bay of Plenty and Waikato regions pa were the dominant site type recorded by NZAA from the 1960s - 80s which Davidson called the "modern era of pa studies" with systematic site recording and some excavation. An objective for archaeology was to refine the understanding and explain the reasons for the appearance of *paa Maaori*. Buck (1949) and Mead (1975) have pinpointed the growth of tribal identity as an important factor in many of the changes that took place in New Zealand prehistory. This paper is based on a personal project to identifying, locating and recording the pa Ngati Pukenga ancestors occupied using traditional narratives and NZAA site recording of pa. The origins of Ngati Pukenga are Mataatua waka and ancestor Tanemoeahi, the father of Pukenga in the Urewera. Through intermarriage and migration the uri (descent groups) of Pukenga merge with the uri of Rongopopoia at Ohiwa, live in Opotiki and Waiaua. They migrate to Maketu and Papamoa and during the 19th century relocate to Maketu, Te Puke, Motiti Island, Rotoiti, Totara Pa by Thames, establish Haowhenua at Maungatautari, return to Maketu and eventually back to Tauranga in 1860. By 1900 they are located on their lands at Pakikaikutu (Whangarei), Manaia (Coromandel), Ngapeke (Tauranga) and Maketu, from 19th century *tuku whenua* (gift) and *toa* (conquest).



The Bioarchaeology of mobility: addressing issues of time and distance

Sarah Karstens, *Department of Anthropology, University of Auckland*

Harry Allen, *Department of Anthropology, University of Auckland*

In contrast to the traditional typological categories of mobility, where populations were viewed as sitting somewhere along a continuum from fully mobile to fully sedentary, there is an increasing awareness that mobility is in fact universal even within populations traditionally considered sedentary. It is however, highly variable and multi-dimensional and often needs to be understood at the level of the individual rather than the population. Much of this variation relates to the time-scale on which movement occurs and the distance of any movement.

Bioarchaeology has at its disposal a range of direct and indirect methods for studying aspects of human mobility. These include isotopic analyses, studies of biomechanics/robusticity and DNA analysis. However, due to limitations of many of these techniques such as time-averaging and the spatial distribution of isotopic variability, the movement of individuals over large distances and discrete time periods e.g. childhood to adulthood, are far easier to identify than those that occur sporadically, over short geographical distances or for short periods of time. As a result the true range of variation in human mobility in any given context often goes unidentified. This in turn has implications for how we understand the role that the movement of individuals has on other aspects of culture and society from resource use to distribution of labour. This paper aims to outline how these limitations impact studies of human mobility within the New Zealand and Australian context and discuss the types of research design that could aid in addressing these issues.

Interpreting maritime accounts of life in 16th and 17th century Oceania

Nicholas Keenleyside, *New Zealand Maritime Museum*

Original accounts of 16th and 17th Century voyages by Europeans in Oceania can provide a wealth of valuable information on the peoples, exchange networks and

environments of the region at that time. These early voyages preceded the 'scientific' expeditions of Cook, Malaspina and others. However, caution and patience is required in the interpretation of these historic narratives to ensure that information is understood in context. Translations are often inconsistent or incomplete and interpretations are shaped by the perspectives of their period of production. Use of these records to corroborate archaeological research has sometimes been selective and piecemeal. The examples of chronicles from the voyages of Mendaña to the Solomon Islands in 1567-8 and Quirós to Vanuatu in 1605-6, show how these accounts offer unique insights into communities, events and encounters. The most accessible insights are into the lives of the ship's company, as those are the people mostly closely observed and better understood by the narrators. However there are often rich and detailed descriptions of the material culture of island communities, which can be compared and contrasted with the archaeological record of related sites. These old accounts can also be of significance and value to the contemporary island communities living at these points of encounter as they can be considered by them in the context of their own oral histories and genealogies.

CHM GIS: Everything is terrible/ Everything's not terrible

Ainslee Kells, *ACT Heritage*

Tom Sapienza, *Extent Heritage*

This paper is a critical look at the current state of GIS analysis and map design in cultural heritage management, as seen from the viewpoints of a person who works directly with the results of CHM GIS and a person who spends most of their time doing CHM GIS. Consulting archaeologists today have massive processing power on their desktops, terabytes of data publicly available to use, and free software that can eliminate the barrier-to-entry of cost, and yet it really doesn't feel like we're living up to our full GIS potential. We've got a billion options at our fingertips, and the most we usually get to do is buffer() it and call it a day.

In this paper, we'll examine practical, methodological, and theoretical issues with how archaeologists typically use/misuse GIS in consulting reports. Some of these issues we have solutions to, some we have strong thoughts and feelings about, and for some we can only offer shrugs of "we dunno!" There won't be consensus

with the solutions we offer, of course, but we hope that the discussions and disagreements that arise will in turn lead to deeper analysis of the issues.

Archaeology is a heavily spatial field, and as a field we're lucky to have the opportunities to work on interesting topics with diverse spatial problems. However, we need to think more about how we think about and conceptualise spatial problems, how we present them (to the public / indigenous communities / clients / each other), and what more we could and should be doing with the data and problems we have at hand.



Mechanising Fibre Production: The New Zealand Flax Mill Project

Alana Kelly, *University of Otago*

Flax has a long history of use in New Zealand as a crucial source of fibre in traditional Māori society, which then sparked the interest of ship-bourne Europeans, always on the lookout for fibre to make rope. Characteristics of New Zealand flax (*Phormium tenax*) made it difficult to process by methods used in the northern hemisphere until the introduction and adaptation of powered mills in the mid-19th century made it possible to sustain commercial levels of production. The NZ Flaxmill Project is the first attempt to document the archaeological footprint of this industrial phase of production, which endured through multiple highs and lows, largely in correspondence with global periods of war, from 1860 when the first mill was established until 1985 when the last one closed. This paper presents an overview of the project and highlights results of recent fieldwork.

The archaeology of human-induced disasters

Jack Kemp and Dr Bill Guthrie, *private researchers*

In 1939 Australia and New Zealand entered World War II. By 1942 the threat of a planned Japanese invasion appeared to be very real. In February of that year Darwin had been attacked by Japanese bombers and over 200 people had been killed. In New Zealand Nazi Q ships had been marauding around the coast and had sunk allied shipping.

Researchers, using oral histories, archival material and archaeological assessments, have uncovered a large amount of military infrastructure associated with World War II. Because of the necessary secrecy of war many of these military camps were unknown to the majority of the populace. The study has focused on Northland, New Zealand. The two authors will share their findings of this recent but forgotten past.

Initial colonisers and early settlers: isotopic insights into migration and subsistence patterns in the prehistoric Pacific Islands

Rebecca Kinaston, *Department of Anatomy, University of Otago*

Hallie Buckley, *Department of Anatomy, University of Otago*

Richard Walter, *Department of Archaeology and Anthropology, University of Otago*

Ben Shaw, *School of Biological, Earth and Environmental Sciences, University of New South Wales*

Stuart Hawkins, *Archaeology and Natural History, The Australian National University*

Michael Richards, *Department of Archaeology, Simon Fraser University*

Neolithic populations sailed thousands of miles to settle a vast Pacific island landscape. The speed at which the earliest Lapita populations crossed through Near and into Remote Oceania indicates that these people not only had advanced sailing technology and navigational expertise, but were highly adaptable to increasingly less diverse tropical island environments as they moved east. Millennia later, there was another mass migration movement in the Pacific as populations migrated into Eastern Polynesian ca. 1000-700 BP. The settlement of temperate New Zealand at the later end of this date range was unique because of the ecological differences compared with the tropical Pacific. Here we use the published results of isotope studies of human and animal remains from a number of early settlement sites in the Pacific Islands, including New Zealand, to address population movement and dietary adaptations. Interpreted in conjunction with archaeological, linguistic and ecological data, the isotopic results indicate that there are common settlement trends regardless of temporal period, including high levels of human mobility,

broad-spectrum foraging and free-range methods of animal husbandry.



In search of the land of milk and honey - using isotopic approaches to study colonial mobility

Charlotte L. King, *Department of Anatomy, University of Otago*

Hallie R. Buckley, *Department of Anatomy, University of Otago*

Peter Petchey, *Southern Archaeology Ltd, Dunedin*

Tori Duxfield, *Department of Anatomy, University of Otago*

Rebecca Kinaston, *Department of Anatomy, University of Otago*

Lisa Matisoo-Smith, *Department of Anatomy, University of Otago*

Darren R. Gröcke, *Department of Earth Sciences, Durham University*

Geoff M. Nowell, *Department of Earth Sciences, Durham University*

European colonisation of New Zealand was often undertaken with the aim of 'improving' the lives of settlers. People came to New Zealand from across the British empire and elsewhere, in search of fortune and better circumstances. In this study we explore colonial mobility using an in-depth isotopic and genetic approach. We analysed multiple tissues from individuals (n=27) buried in the colonial period cemetery of St. John's, Milton. Isotopic results from tissues which form during childhood, allowed the differentiation of those born locally and those born elsewhere (i.e. the early European settlers). Analysis of tissues that form later in life, and close to time of death allowed assessment of changes to diet and health status upon arrival and settlement in New Zealand. In addition, mtDNA evidence identifies maternal ancestry which can link individuals to possible locations of ancestral origins. The lines of evidence together potentially allow identification of unknown individuals, and provide detailed life-histories of these early Pākehā New Zealanders. Here we will use these individual narratives to discuss aspects of colonial living, examining where people came from to settle in Milton and the conditions they experienced once in the colony.

The sharpest tool in the shed: an analysis of stone adzes from the Auckland (Tamaki) Region

Brendan Kneebone, *University of Auckland*

Over the course of around five centuries, pre-European New Zealand society underwent a considerable amount of change in a relatively short period of time. From initial Polynesian colonisation somewhere around 1200 A.D. to the arrival of Captain Cook in 1769, it is argued that the country witnessed increasing conflict and competition for resources, changes in subsistence and settlement patterns, changes in material culture (i.e. adzes and fishhooks), and shifts and contractions in communication networks. While there is a general model of change within New Zealand, relatively little is still known about most regional rates of change.

The aim of this research was to conduct a comprehensive analysis of stone adzes from around the Auckland (Tamaki) region in the context of this wider New Zealand model of change. The analysis used an assemblage of 144 artefacts from eleven different sites/contexts from around the Auckland region. The assemblage was divided into four temporal periods spanning the pre-European Maori sequence based on radiocarbon dates. The research was completed in three stages including a morphological and typological analysis. The final stage - which is the focus of this presentation - was a geochemical sourcing analysis using pXRF, intended to assign each artefact to a raw material type, and that raw material to a geological source. This has the potential to inform on distribution and communication networks, as well as spatial interactions.

While superficially the results of this analysis may fit the existing model of change in New Zealand, the timing and rates and of change within this general trend are far more variable than the model might suggest.



Yarta, Muda and Yura malka

Jacinta Koolmatrie

Indigenous ways of knowing have predominantly been placed separately and secondary to those of the

archaeologist. This research questions this separation by placing Adnyamathanha knowledge at the forefront to highlight the voices of Adnyamathanha people. As an Adnyamathanha person, this study has been guided by the input of my Elders and the ethical standards that I have learnt from my own lived experience as an Adnyamathanha person. Importantly, this cultural background provides and provokes new conceptual frames, and intellectual trajectories within archaeological thought.

The presentation explores the connection between Yarta 'Land', Muda 'Dreaming' and Yura malka 'Aboriginal markings', as understood by Adnyamathanha people. Located in the Flinders Ranges region (South Australia), is Malkai, an important rockshelter for Adnyamathanha people. Prior recording of Malkai does not include Adnyamathanha people and essentially discusses the place as though Adnyamathanha people were unaware that it existed. However, this research demonstrates that there is a multitude of information about Malkai and the surrounding landscape. These narratives include ancestors from living memory, non-living memory and people who connect with Malkai today. This presentation not only explores how Malkai sits within the landscape, but also how narratives are formed around Malkai by Adnyamathanha people, archaeologists, and now an Adnyamathanha archaeologist.

Use of experimental evidence to interpret the function of pits on stone artefacts from Australia and Papua New Guinea

Nina Kononenko, *Australian Museum/University of Sydney*

Val Attenbrow, *Australian Museum/University of Sydney*

Robin Torrence, *Australian Museum/University of Sydney and Centre for Australian Biodiversity and Heritage*

Peter White, *University of Sydney*

Brit Asmussen, *Queensland Museum*

Small percussion pits commonly visible on stone artefacts found on archaeological sites in Australia and Papua New Guinea have often been interpreted as resulting from bipolar knapping of stone or processing nuts. Breaking, or cracking, nut shells and pounding kernels are all likely causes of the pits because these tasks are frequently reported in ethno-historical sources. Previous replicative experiments have investigated the surface modifications

on stone tools used to crack and pound nuts/seeds, but to date diagnostic patterns of use damage that clearly distinguish between different tasks have not been adequately identified and systematically described. This paper reports a comprehensive, comparative analysis of use-wear traces on nut-processing experimental stone tools and compares these with use wear traces on stone artefacts from Australia and Papua New Guinea. The aim of the experimental study is to explore the functional relationship between nut processing and pitted stones and to describe diagnostic use-wear traces that can be used in the interpretation of stone implements with evidence of percussion activities.



Experimental work in faunal taphonomy: analysing tooth-marks from the major Australian terrestrial carnivore taxa

Loukas Kounigoulos, *The University of Sydney*

Wild carnivores can be involved in the formation of archaeological faunal assemblages through habitation and scavenging behaviour, which can have implications for understanding ancient human diet and foraging. Actualistic approaches have been taken to identify and describe the kinds of damage that Australian carnivores leave, by examining the remnants of bone in their scats and meal remnants, and to match this data to examples in the archaeological record. But thus far none have made comparisons across the multiple unrelated taxa that constitute the Holocene terrestrial carnivore, in the way that archaeologists working in African and Eurasian settings have been doing for decades. I carried out a series of feeding experiments with captive dingoes, devils, quolls, lace monitors, dogs and people to describe the quantitative qualities of their tooth-marks, and compare them to see whether they might be differentiated successfully. An analysis of ~3000 produced tooth-marks confirmed that a high level of overlap between the tooth-mark sizes of major Australian species exists, this being largely due to the capacity of dasyurids to produce very large marks comparable to those of larger dingoes, dogs and people. Furthermore, the tooth-marks of the Tasmanian devil overlap or even exceed the size of marks from some much larger African/Eurasian carnivores. These findings indicate that broad body size based categories for carnivores do not correlate well with

corresponding tooth-mark size in Australia as they might overseas, and that therefore identifying taphonomic agents using this sort of metric is highly complicated. They also suggest that tooth-mark size is not only determined by body size/weight, but also by morphology – in this case adaptations for osteophagy – that affect dentition and jaw power. Additional analysis has investigated the effect of sample size and sub-sampling processes based on mark visibility on comparisons between species, the results of which are also presented here.



An archaeological imagination of seascapes: the human perception and experience of the sea

Anja Krieger, *Department of Classics, Stanford University*

This talk addresses the human maritime experience as an intrinsic part of seascape. As a hybrid concept, seascape refers both to the human perception and experience of the sea, i. e. cultural forms of seafaring as well as the physical geography and topography of surrounding coastal areas. This concept hence encompasses tangible and intangible evidence, that is archaeological objects as well as textual and iconographic sources that illustrate life with, from and on the sea. This paper seeks to explore this notion through a thick description of life on board of several shipwrecked vessels from the Late Bronze Age and Archaic Period using objects that can be interpreted as personal objects or as part of the ship equipment. The specific wrecks are from the Eastern Mediterranean and among the finds recovered from the seabed are objects that attest to the practicalities of the daily life of sailors and passengers, specifically distinctive topics such as navigation and mental maps, food and everyday practices, but also violence and death. Comparative textual sources and iconography from the Mediterranean as well as from other time periods and regions - specifically the Pacific and Northern Europe - shall be included to further analyze patterns of similarities in lifestyles of people in different geographical environments and to enhance the knowledge drawn from archaeology.

Examining spatial variability in the exploitation of Queensland's prehistoric marine fishery: Current perspectives and future research objectives

Ariana Lambrides, *James Cook University*

Ian McNiven, *Monash University*

Sean Ulm, *James Cook University*

The sea holds pivotal economic, social, cultural and spiritual significance for Aboriginal and Torres Strait Islander people of Queensland's coasts and islands. Oral histories, documentary sources and archaeological evidence have demonstrated that over millennia, coastal foraging and fishing were fundamental to lifeways across this region. Yet, researchers working along the Queensland coast for decades have frequently reported low abundances of fish bone when compared to shellfish remains at many archaeological sites. These sparse fish remains are particularly noteworthy when compared to sites in the adjacent Torres Strait and Pacific. Here we present a synthesis of current archaeological evidence of marine finfish exploitation along the length of the Queensland coast, and its islands, to better understand spatial patterning in the abundance and ubiquity of fish taxa exploited. While gaps in our knowledge remain, particularly the exploitation of islands along the length of the Great Barrier Reef (GBR), current research in the Lizard Island Group, northern GBR, has returned a large fish bone assemblage, which offers a unique opportunity to assess the exploitation of offshore islands in the region as well as key factors influencing finfish biodiversity and landscape dynamics through time.



Transformations in Plot Attributes from 1870s - 1930s in Dunedin's Historic Northern Cemetery

Jennifer Lane, *University of Otago*

Dunedin's Historic Northern Cemetery (DHNC) is a non-denominational cemetery that contains over 18,000 burials from 1873 to 1937 when the last plot was sold, although cremated family members are still permitted in family plots. Unlike contemporary cemeteries that were separated into denominational or ethnic divisions,

DHNC was divided into four classes of blocks based on the sizing of these plots and the height of their memorial structures. In this study only Extra-First, First, and Second class plots are investigated due to a lack of memorialisation of Third class burials.

This research identified the transformations in 23 attributes of 1407 markers and plots, including: morphology; iconography; inscriptional elements (such as the memorial inscription, lettering, language, and epitaph); marker materials; height; condition; class; date and decade; footstones and materials; fences and materials; concrete coverings; masons markings; and geographic affiliations.

Transformations in the commemoration of individuals and attitudes towards death are inferred through marker attributes, which are influenced by the agency, identity, and ideology of the community. Identifying the stylistic and functional attributes of types of markers and memorials is important for understanding the transforming value of the deathscape to Dunedin's communities.

This presentation shows a part of my MA thesis research, which analyses the functional and stylistic transformations in markers and memorials in decades surrounding the First World War (1914-1918), specifically the transformations between pre-WW1 and post-WW1 decades. The wider study also identifies the implications of these changing attitudes towards death and commemoration in Dunedin society.

Re-analysis of the 'engraved' Diprotodon tooth from Spring Creek (Victoria)

Michelle C. Langley, *Griffith University*

Establishing the role of humans in past extinctions is critical if we are to future proof the planet from ourselves. Over the past 45,000 years, numerous megafaunal species disappeared from Sahul (Pleistocene Australia-New Guinea), and researchers are yet to determine if climate change and/or human activity were the primary cause. Evidence for direct interaction of Australia's First Peoples with megafauna is slim, with one of the strongest cases having been a 'engraved' incisor from the giant wombat-like *Diprotodon optatum* recovered from Spring Creek Locality situated in Eastern Maar

country in southeastern Australia. Here we present the recent re-analysis of this specimen, the results of which demonstrate that the incisions were not made by human hands. Instead, we were able to identify that the marks were created by a small (2-5 kg) mammal, most likely a scavenging spotted-tailed quoll (*Dasyurus maculatus*) who gnawed on the tooth shortly after the death of the *Diprotodon*. Removal of this most promising piece of evidence for direct interaction of people with living megafauna has significant implications for our understanding of their disappearance from Sahul.



Using GIS to understand cultural dynamics through the lens of rock art, NE Kimberley, Australia. Challenges and potential of a geospatial analysis

Mariangela Lanza, *School of Social Science, University of Western Australia*

Recent surveys in Australia's NE Kimberley, conducted within Kimberley Visions ARC Linkage project, discovered 1034 rock art sites that display iconographic and stylistic similarities/differences with other rock arts traditions in the Kimberley, Arnhem Land and desert regions. Given the problems of dating rock art, a geospatial analysis can provide new insight into social dynamics, helping understand possible cultural connections, routes of travel and exchange, and shared cultural blocs. A Geographic Information System can be used to quantify the influence that topography and environment exercised on human adaptive strategies in this dynamic landscape. Identifying possible routes travelled by people, artefacts, goods or ideas can broaden our knowledge about Pleistocene and Holocene spatial, cognitive and social behaviour, for a better understanding of the process that led to the so called rock art style 'provinces' in northern Australia. This paper reviews theoretical and methodological challenges of a geospatial analysis focused on the Kimberley's Drysdale River and King George catchments, dealing with gaps in detailed topographic data recording. I conclude by considering the distribution of drowned art sites and how these might be targeted, given that today's Kimberley is approximately half of the original land mass that reached its maximum extent during the LGM. This work is carried out with Balanggarra Aboriginal Corporation under the Kimberley Visions: Rock Art Provinces of Northern Australia ARC Linkage Project.

The Cabana Site: Review of evidence for horticulture in the early Settlement Phase of New Zealand

Mana Laumea, *W. Gumbley Ltd.*

Warren Gumbley, *The Australian National University, W. Gumbley Ltd.*

The Cabana Site T12/3 is part of the larger Whangamatā Early Settlement Phase site (T12/2 & T12/3) at the mouth of the Whangamatā Harbour, and has been investigated several times (Allo 1972, Gumbley 2014, Jolly 1978 Shawcross 1964). Recent radiocarbon dates place the occupation in the mid-13th century AD (Gumbley 2014). In the course of two recent investigations (2007 and 2016) several lines of evidence demonstrate that Polynesian cultigens were consumed at the site and that horticultural activities (gardening) and crop storage also occurred at the site during this time. This paper reviews and describes this information and seeks to place the data within the context of the adaptation of Polynesian horticultural practice to New Zealand.

Unmaking rivers: landscapes of flow on Victoria's Loddon River

Susan Lawrence, *Department of Archaeology and History, La Trobe University*

Peter Davies, *Department of Archaeology and History, La Trobe University*

Jodi Turnbull, *Department of Archaeology and History, La Trobe University*

Ian Rutherford, *School of Geography, University of Melbourne*

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Ewen Silvester, *Department of Environment, Ecology and Evolution, La Trobe University*

Francesco Colombi, *Department of Environment, Ecology and Evolution, La Trobe University*

Darren Baldwin, *Rivers and Wetlands*

Mark Macklin, *School of Geography, University of Lincoln*

Jude Macklin, *School of Geography, University of Lincoln*

The land/river-scape of the Loddon River valley in central Victoria has been profoundly made and remade over

the past 150 years through the combined processes of human activity and dynamic natural cycles. For millennia the Loddon flowed through an interlinked chain of deep, shaded pools that held water on country through the driest summers. After British colonisation miners used the river as a sludge drain for fifty years, filling the pools, choking the channels and covering the fertile floodplains with sand and silt. The river was a conduit that connected the mining towns with farmers and graziers on the distant plains. For generations the control of the river was intensely contested as those on its banks sought to use it for competing purposes. While people talked the water flowed with its own rhythms of deposition and incising, reshaping land and river all along the valley. This paper follows the flow of water and mud in the Loddon from the highlands of central Victoria to the Murray River, drawing on archival and archaeological research, geomorphology, geochemistry, LiDAR, GIS, pXRF and visual art (print-making) to explore the ongoing processes of human-river entanglement.

Social network analysis in Northern New Zealand

Thegn Ladefoged, *University of Auckland*
Caleb Gemmell, *University of Auckland*
Dion O’Neale, *University of Auckland*
Alex Jorgensen, *University of Auckland*
Hayley Glover, *University of Auckland*
Christopher Stevenson, *Virginia Commonwealth University*
Mark McCoy, *Southern Methodist University*

A social network analysis of the spatial and temporal distribution of obsidian artefacts provides insights into the transformation of pre-European contact Māori society. Incorporating data from previously excavated Northern New Zealand assemblages we are using pXRF sourcing of obsidian artefacts to determine the flow of material and developing obsidian hydration dating to establish relatively precise chronologies. Our spatio-temporal network analysis is providing insights into how Māori fused historical contingencies with economic considerations during the transformation of society from village-based groups to powerful lineages and tribes.



Identifying siliceous ‘tool stone’ resources with advanced remote sensing: a case study from central Australia

W. Boone Law, *Department Ecology and Environmental Science, University of Adelaide*
Bertram Ostendorf, *Department Ecology and Environmental Science, University of Adelaide*
Megan M. Lewis, *Department Ecology and Environmental Science, University of Adelaide*

Accurately identifying sources of raw materials for stone artefact manufacture is a prominent theme in Australian Aboriginal archaeology and landscape archaeology worldwide. Traditionally researchers have relied upon geological maps, geomorphology, and artefact attributes to identify the origin of lithic raw materials, often with less than satisfying results. This paper takes a novel approach to identifying chalcedony, a high-quality siliceous raw material used for stone artefact manufacture in central Australia. In the following study, we utilise georeferenced HyMap hyperspectral aerial imagery and ASTER multispectral satellite imagery to discriminate areas of high potential chalcedony mineralisation and silica-rich rock near the Dalhousie Springs Complex of far north South Australia. The successes and practicalities of this approach to Australian archaeology are evaluated and discussed.

Travelling with the archive: using objects to evoke Country in native title research

Belinda G. Liebelt, *Flinders University and South Australian Native Title Services*

In May 2018 I was sifting through the archives of Rev. Clamor Schürmann, a Lutheran missionary whose 1840s ethnographic observations of Aboriginal people on Eyre Peninsula are renowned. Schürmann’s mission was to convert souls, but he was officially employed to mediate violent conflict between colonists and the Aboriginal population. His letters reveal he often felt isolated and despondent – struggling against the colonial rule of law and his religious comrades. Among Schürmann’s official correspondence, I uncovered a weathered, Germanic pocket-bible – a symbol of his faith. Using this bible and his letters, I ‘travel’ to the places Schürmann

visited; evoking temporal linkages between his original encounters in place and my experiences 'revisiting' them for native title 'connection' research.

Tweetable summary: Using Clamor Schürmann's pocket bible, Belinda Liebelt 'time travels' to the Port Lincoln colonial frontier, evoking temporal linkages in cross-cultural place encounters, both past and present.



The landscapes of convictism on the York Road

Sean Liddelow, *University of Western Australia*

My honours research investigates landscapes of convictism and modernity in Western Australia, focusing on the York Road. The road ran between the settlements of Guildford on the Swan River and York in the Avon Valley region. Weaving through the landscape, it facilitated the passage of goods including sandalwood and wool. However, the road was in poor condition. Therefore the maintenance of the road became an economic necessity. The arrival of convicts in 1850 provided a means in which the road could be maintained. Convict accommodation and construction sites, including road stations and road camps, contributed to the cultural landscape of the York Road. The specific sites that will be studied are Bilgoman Well, Chauncy's Spring and Saint Ronan's Well. I will undertake historical research and conduct archaeological survey at these sites. An aspect of this research is the association of sites with the natural landscape of creeks and waterholes. These cultural and natural landscapes will be mapped to provide a greater understanding of convict places in Western Australia and the modernity that came with the convict-built infrastructure. The mobility of convict labour in the landscape will also be assessed. The question of which sections of the road were repaired and when shows change in the cultural landscape through time. Finally, a site typology will be established; archaeological survey will be used to determine the archaeological signature of road stations and road camps, and the distinguishing features of these sites. This research is significant in that it increases knowledge of peripheral public work sites, which are often sidelined by administrative places such as Fremantle Prison.

The reading of sedentism from pathology? An alternative view from South Australia

Judith Littleton, *Department of Anthropology,
University of Auckland*

During the 1980s with the undertaking of large scale palaeopathology surveys, it was argued that signs of disease upon skeletons reflected the degree of sedentism of different societies. The association was based upon models of disease ecology that assumed as population densities grew and residential mobility decreased humans began effectively living in their own filth and were subject to higher rates of disease and nutritional stress. In this sense sedentism was defined as limited or no mobility and reliance upon a range of restricted resources. Furthermore it was assumed that the absence of disease and nutritional stress should equate to a lack of sedentism.

There are significant questions that can be applied to the interpretation of archaeology in this fashion: the osteological paradox (the dead are a non-representative sample of the living); the interpretation of lesions as a mark of health or illhealth; and the specific diagnosis of lesions. Furthermore while the correlation between population density, low mobility and disease might work at the broad scale between different types of residence pattern, does it work when the comparison is between neighbouring groups and societies? This raises the issue – what do we mean by sedentism and what parts of it, if any, are linked to those patterns of disease.

In this paper I analyse these ideas in relation to the palaeopathology from Roonka, South Australia. The site has been taken as evidence, along with other places along the Murray River as evidence for sedentism but the frequency of pathology observed among these human remains differs from values recorded by Webb from neighbouring regions. Is this really a difference in sedentism or something else entirely.

Encountering Quarantine

Peta Longhurst, *Sydney Living Museums*

My first encounter with Sydney's quarantine station came at the age of eleven - first in the pages of a novel, and then as ghost stories as we explored the moonlit landscape. I returned years later as an archaeologist

to document, interrogate, and interpret the institution, spending weeks walking across the landscape and sleeping in the same buildings that had been occupied decades earlier by the people I studied. Here I reflect on the ways in which these two very different encounters intertwine and coalesce in my perception of place.

Tweetable summary: From ghost stories to archaeological interpretations, I consider how two diverse encounters with Sydney's quarantine station influence my perception of place.



North Stradbroke Island Midden Excavation

Serena Love, *Everick Heritage Consultants*

Morgan Disspain, *Everick Heritage Consultants*

Katherine Woo, *University of Sydney*

Michael Costello, *Quandamooka Yoolooburrabee Aboriginal Corporation*

This poster presents the results of an excavation of a midden site at Point Lookout, on North Stradbroke Island, Queensland. Everick Heritage Consultants worked in collaboration with the Quandamooka Yoolooburrabee Aboriginal Corporation to excavate the midden, which survived in an open beach environment despite intensive sand mining in the surrounding areas. The radiocarbon dates for the midden range from 518–429 cal. BP to 237–41 cal. BP. Excavated material includes fish bone, fish otoliths, and shell, all of which provide information about the past inhabitants of the site and their subsistence strategies.

Environmental and ecological data for the shellfish and fish taxa present in the midden shows that they are all marine taxa, which are still present in the Moreton region today; most of them are still able to be found on the beaches near the Point Lookout midden. Twenty-five potential shell tools were identified; all were manufactured using valves of *Plebidonax deltoidea* (Pipi/Eugarie). Of the 25 identified tools, three had preserved residues. The fish otoliths were analysed to determine the age and size of the fish, as well as the season of death, thereby revealing information about fishing strategies of the past site occupants. A GPR survey of the midden has revealed further information about the site and provides direction for future research and management of the midden.

Geochemical analysis of obsidian in New Zealand

Andrew McAlister, *University of Auckland*

Obsidian is ubiquitous in New Zealand archaeological sites, signalling its economic and social importance to Māori. Consequentially, researchers have long realised its potential to address a variety of anthropological questions and, in New Zealand, we are in the fortunate position of being able to draw on over six decades of previous research.

In recent years, the use of portable X-Ray fluorescence (PXRF) instruments have allowed rapid, non-destructive and cost-effective analyses of large assemblages. However, in order to exploit this technology to its full potential, a comprehensive dataset of reference materials is essential.

In this paper, a reference dataset of over 1800 specimens covering all known sources is presented. While this large dataset provides better understanding of the variability of obsidian sources, it also requires complex analytic methods, which presents challenges for communicating results to non-specialists and the general public.

Interpretations of Spatial Data in the Northern Growth Corridor of Melbourne, Victoria

Renee McAlister, *Heritage Insight Pty Ltd*

Fiona McConachie, *Wurundjeri Land Compensation and Cultural Heritage Council Aboriginal Corporation, & RMIT School of Science (Geospatial Science)*

The northern end of the Merri Creek corridor is currently undergoing extensive land use change, from a primarily agricultural and pastoral history to the largest residential development in Victoria. As a result, compliance driven archaeological and ecological assessment has resulted in detailed mapping of cultural assets, including tangible cultural heritage material, cultural values and species. This information, however, has the potential to be used in a more extensive and informative manner to recognise and protect significant cultural and ecological values, and allow them to inform planning and future development processes.

The use of geospatial sciences for cultural mapping is a proven method for identifying broader landscape uses and cultural values with Indigenous communities. Today our understanding of place and place-based relationships offer improved understanding of landscape use beyond single site-based analysis. This work also relies on understanding what information can be and should be collected using spatial data and qualitative techniques for cultural mapping.

This paper presents a discussion on the restrictions of compliance-based processes, limitations of the current regulatory framework, and proposes some ideas and options for working towards increasing external valuation of the important intangible assets.



Access, Procurement and Reduction: a comparative geochemical and technological investigation of obsidian from Houhora and Ahuahu , Northern New Zealand

Rowan McBride, *University of Auckland*

Understanding the strategies underlying the access to and procurement of stone resources is extremely useful in the study of past populations in New Zealand. In order to investigate these strategies, they must be contextualised within broader environmental, economic and societal variables. Stone tools, being both durable and exceedingly informative, provides an excellent mechanism from which to investigate these behaviours. The research outlined by this paper focuses on a combination of geochemical sourcing and technological analysis of two obsidian assemblages from New Zealand. Houhora, Northland New Zealand, and Ahuahu EA64 (Great Mercury Island), of the east coast of the Coromandel New Zealand, are two archaeological sites with extensive obsidian assemblages, where the strategies of obsidian access and procurement are unidentified. Through the identification of primary and supplementary obsidian source locations, and a comprehensive reduction intensity analysis, a detailed understanding of how access and procurement strategies functioned can be interpreted. The reduction intensity of the obsidian assemblage is considered in light of the access and procurement strategies, direct or indirect, indicated by the assemblage. The results of this analysis

suggest that obsidian from the Houhora archaeological site was directly procured, while the obsidian from Ahuahu EA64 was procured via indirect mechanisms.

Shhh! It's a Secret: Present sensitive cultural asset data

**Fiona McConachie, *RMIT University Surveying and
Spatial Science***

In the never ending quest to achieve greater and greater spatial data accuracy, the drive for open access to data and the ubiquity of spatial data capture we can often overlook the need for data confidentiality, privacy and sensitivity.

Managing sensitive information has been an ongoing concern in other fields of research including health, social and financial data but there have been limited examples of data desensitisation use in cultural asset information management. Data desensitisation is also a widely recognised issue for Indigenous communities who are seeking greater influence in information management. It is important given the demand for greater informational accuracy to discuss how information can be usable, useful and significantly reduce the potential for harm to cultural assets. Cultural asset information in this context includes archaeological, ethnographic and environmental elements.

This presentation explores data desensitisation, where and how it can be incorporated into presenting cultural asset data. It will also look at the range of different options for spatial data desensitisation and explore how Indigenous communities have and can utilise these different techniques to assist in the representation of sensitive cultural asset data.



Investigating the origins and impacts of tuberculosis in the Pacific

Kate McDonald, *University of Otago*

Lisa Matisoo-Smith, *University of Otago*

Hallie Buckley, *University of Otago*

Richard Walter, *University of Otago*

Michael Knapp, *University of Otago*

Tuberculosis is a bacterial disease responsible for a significant number of deaths in humans, as well other economically important or threatened animal species. Previously, it was thought that tuberculosis was spread outside Eurasia and Africa with European colonisation. Recent genomic research by Bos *et al.* (2014) has found evidence for the spread of tuberculosis to the Americas with pinnipeds, prior to a spread of the bacterial complex by way of European colonisation. Currently there is only inconclusive palaeopathological evidence for tuberculosis in Pre-European human populations across the Pacific, however, New Zealand pinniped populations have been found to be infected a pinniped-adapted form of tuberculosis (*Mycobacterium pinnipedii*), making them a potential vector for the disease to human populations in the Pacific. We are using ancient DNA (aDNA) methods to screen for and extract mycobacterial DNA from archaeological populations of seals and sea lions. This allows us to identify *Mycobacterium* strains present in Pre-European pinniped populations in New Zealand, and compare those to *Mycobacterium* strains found in past and present human and pinniped populations. This approach allows us to investigate long-standing questions about the history of tuberculosis in the Pacific, and may not only help discerning health and interactions in past populations, but also assist in understanding and predicting the spread of the bacilli in modern populations.

Reference

Bos, K.I., Harkins, K.M., Herbig, A., Coscolla, M., Weber, N., Comas, I., Forrest, S.A., Bryant, J.M., Harris, S.R., Schuenemann, V.J., Campbell, T.J., Majander, K., Wilbur, A.K., Guichon, R.A., Wolfe Steadman, D.L., Cook, D.C., Niemann, S., Behr, M.A., Zumarraga, M., Bastida, R., Huson, D., Nieselt, K., Young, D., Parkhill, J., Buikstra, J.E., Gagneux, S., Stone, A.C. & Krause, J. 2014. Pre-Columbian *Mycobacterium* Genomes Reveal Seals as a Source of New World Human Tuberculosis. *Nature*, 514 (7523): 494-497.

Earthquakes and Tsunamis in New Zealand; their effect on Maori, and what they mean for present day coastal communities, with particular reference to the Southwest North Island Coast.

Bruce McFadgen, *School of Maori Studies, Victoria University of Wellington*

The New Zealand Environment is tectonically active and tectonic events, both earthquakes and tsunamis, have influenced human communities since NZ was first settled some 700 to 800 years ago. Hazards include tsunamis, earthquakes, coastal erosion, and burial of settlements, gardens, and resources by sand dunes. Earthquakes can be beneficial, or a disaster. Much of our infrastructure and population today occupy low-lying land close to the sea, e.g. SW Nth Is Coast, and people are concerned about hazards of living near the water. One way to better understand the hazards and their likely effect on modern society today is to know what happened in the past. This paper will briefly discuss what coastal archaeology can tell us about earthquake effects on past Maori Society. It covers New Zealand generally, and SWNI Coast specifically. The lessons are sobering, and Modern society can learn from the Maori experience when preparing for future events.

Delta-R corrections for marine shell dates in New Zealand archaeology – a regional perspective.

B.G. McFadgen, *School of Maori Studies, Victoria University of Wellington*

N. Litchfield, *GNS Science, Lower Hutt*

R.G. Sparks, *Crofton Downs, Wellington*

The radiocarbon content of the ocean differs from that of the atmosphere, and also from place to place, as a result of processes such as: upwelling of deep radiocarbon-depleted water; and input of fresh water streams and rivers containing old carbon from peat or dissolved carbonate rock. These, and other processes such as exchange of radiocarbon carbon with the atmosphere by wave action, and whether shells are from intertidal or subtidal species, can also affect their radiocarbon content To facilitate the calculation of radiocarbon dates of marine samples in calendar years, an assumed mean value has been adopted for oceanic radiocarbon, and

corrected regionally by use of a local difference from the mean value, called DeltaR. In New Zealand, this difference has been found by measuring the radiocarbon content of local marine organisms, usually intertidal or immediately subtidal shellfish, collected live on a known date before 1957. In the past, values from different parts of the mainland coast were averaged to provide a single DeltaR that was assumed to apply to all parts of the coast. There are now 55 shell samples of known age, collected from different parts of the mainland coast, Chatham Island, and Auckland Islands that have been dated, and which now provide 55 separate measurements for DeltaR. These values are assessed in this paper; the results indicate that an average value is no longer appropriate, and that a regional approach is needed. Regional values are presented based on current measurements, understanding that these will probably change as more data becomes available.

Oops wrong harbour! Rediscovery of the Daring shipwreck (1865), Kaipara South Head, New Zealand

Isaac (Zac) McIvor, *Heritage New Zealand Pouhere Taonga*

Robert Brassey, *Heritage Unit, Auckland Council*

Greg Walter, *Heritage New Zealand Pouhere Taonga*

In May 2018 shoreline erosion exposed an unidentified shipwreck on a remote beach near the entrance to the Kaipara Harbour north of Auckland. The wreck was largely intact and remarkably well preserved. It was subsequently identified as the New Zealand-built schooner *Daring* which had been driven ashore undamaged in a gale in 1865. In this presentation we outline the rapid joint agency response undertaken to research, identify and record the wreck and to influence media reporting, since the wreck was at significant risk of souveniring and scavenging of materials. This will include the results of laser scanning and drone based photography undertaken by Recon Ltd to provide a permanent record of the wreck as found.

Replication, copying and experimenting within Archaeology

Lisa McKendry

Experimental and replicative archaeology, undertaken by an experienced practitioner, with customary and

ethnographic knowledge, provides a valuable research tool for archaeologists. This idea is demonstrated through three case studies using archaeological textiles, whose rareness in the archaeological record belies their importance in pre-contact societies. These case studies establish the relevance of this methodology; including tensile testing of cords, and replication of weaving patterns and techniques. The information gained affords an understanding of the time and effort involved in material harvesting and fibre preparation, the range of manufacturing skills and innovative practices. Experimental archaeology not only provides a way to empirically measure customary and ethnographic knowledge, but also provides archaeologists with a more nuanced understanding of objects made from fibre. Further, it can contribute to known customary weaving practices.

Archaeological response to 2011 Canterbury earthquake series

Nick Mainwaring, *WSP Opus Christchurch*

Elsa Koenig, *WSP Opus Christchurch*

This paper presents a project based around the need for a quick response after the Canterbury Earthquake Sequence for one insurance company. The project addressed a risk management plan, process and procedure for the statutory archaeological considerations required for the rebuild to proceed. The project encompassed more than 7,700 house claims which needed investigation and response as per the Canterbury Earthquake Response and Recovery Act 2011. WSP Opus provided the client and New Zealand with an effective protocol and system, setting a new best practice for the industry all while delivering a high level of excellence in consulting practice and client support.

Collaboration and sharing of knowledge between the WSP Opus team, Southern Response, Arrow International, Heritage New Zealand and other stakeholders resulted in developing solutions to many problems and successful results under extreme circumstances. This project was awarded a Silver ANCENZ Award. This project was determined to be Silver worthy for the comprehensive consultancy solution which resolved complex project aspects and limitations of resources so as to thoroughly investigate potential finds without substantial delay of demolition or construction works. Seven years after the Earthquakes, the team is still working on the project. The

framework developed in Christchurch was used again for the Earthquake response in Kaikōura.



Our Heritage Parks

Chris Mallows, *Heritage Unit, Auckland Council*

Mary Kienholz, *Heritage Unit, Auckland Council*

The development of “people’s parks... to supply a field for recreation and amusement” (*New Zealand Herald*, 15 February 1871) in the late 19th century was a direct response to the urbanisation of Auckland and the adoption of British Victorian values. Parks were developed around, what is now the current CBD, on a mixture of greenfield and previously urbanised spaces. Foundations of military barracks, houses, stone walls and other structures all survive sub-surface within these parks. This poster will look at the development of a number of these heritage parks and what lies beneath the ground.

Super-positioning archaeology and experiences through time: Integrating diverse physical and experiential landscapes at Mount Shamrock

Geraldine Mate, *Queensland Museum Network*

Archaeologists build narratives of the past through intellectual engagement with a range of datasets. Walking across an empty paddock the landscape can be perceived as alive with the sounds, smells and vistas of a past long gone. By integrating historical records, archaeological data, maps, photos and sensory imaginings of the landscape, I recreate a vibrant mining town, with people, named places, changing environments, and a sensate resonance. In this paper I will explore how my own life experience have influenced the ways in which I interpret the landscape of Mount Shamrock, a nineteenth century gold mining town in Queensland.

Tweetable summary: Empty paddocks perceived as the landscape of a vibrant mining town, with people, changing environments, and sensate resonance, alive with sounds, smells and vistas of the past

Australian Rock Art: history, conservation and Indigenous well-being

Sally K. May, *Griffith University*

Paul S.C. Taçon, *Griffith University*

Jillian Huntley, *Griffith University*

Andrea Jalandoni, *Griffith University*

This paper introduces and provides an update on the work of a major rock art initiative focused on Australia but with international implications for rock art management and conservation. The Australian Research Council funded program ‘Australian Rock Art: history, conservation and Indigenous well-being’ is a 5 year project based at Griffith University. The overall aim of the project is to ensure that rock art landscapes are better conserved, appreciated and understood for the benefit of local communities and future generations. In this presentation we will provide an update on the work of the team including collaborations with over 20 Indigenous communities around Australia. We will also discuss in more detail one of the case study projects based in Kakadu National Park –The Pathways Project: people, landscape, and rock art in Djok Country.



Rock art replicas in the age of heritage tourism

Laura Mayer, *The University of Western Australia*

The rise of cultural tourism has positioned archaeological sites as venues of economic value. This has created the problem of an ever-growing and continual erosion of archaeological sites as resources. This is particularly evident in original rock art sites, which have been opened and quickly closed to the public after the needs of archaeological preservation could not be balanced with the demands of the tourist experience. One response to the impact of the tourist has been to create replicated attractions, such as Lascaux IV and the Caverne du Pont d’Arc, which foster the illusion visitors are attending the real cave paintings through timed tickets, restricted access, and the employment of a tour guide. Yet despite these instruments, these sites also negotiate a Disney-fication of archaeology through theming, dedifferentiation of consumption and merchandising. This paper explores the notion of tourist experience and

a Disney-fication of immersive replicated rock art sites and asks: is a Disney-fication of archaeology an issue if these types of sites satisfy our emotional, economic, aesthetic and spiritual needs?

From Shell Bed to Film Archive: revisiting archaeological investigations at Anbarra through collaborative archiving

History and Language, *The Australian National University*

Sally Brockwel, ANH School of Cultural History and Language, *The Australian National University*

Kelly D. Wiltshire, *Australian Institute of Aboriginal and Torres Strait Islander Studies*

Over 40 years ago Betty Meehan travelled to Anbarra with her late husband, collaborator and colleague, Rhys Maengwyn Jones, to undertake fieldwork for her PhD. This fieldwork provided the basis for the iconic book *Shell Bed to Shell Midden* (1982), which has influenced generations of archaeologists, anthropologists and other scholars. During this period Betty and Rhys also recorded some of their fieldwork on film; footage that was later archived at the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and has only recently been digitised. Whilst at the time this film footage served as additional documentary device – because “you can’t write down everything” – today it allows us to revisit and (re)experience this field work, revealing places, faces, memories and emotions. In other words, taking a collaborative approach to archiving, understanding and better contextualising this footage allows for some of the hidden histories of fieldwork to be revealed.



Overlooked and underappreciated: How Auckland Council is looking after our historic cemeteries

Joe Mills, Heritage Unit, *Auckland Council*

Mary Kienholz, Heritage Unit, *Auckland Council*

The Auckland region has approximately 300 burial places, including cemeteries, graveyards, urupa and individual graves and burials. Of those 300, approximately 47 are owned or operated by the Auckland Council. The majority

of cemeteries or burial places have significant historic heritage values, and their management presents unique challenges in preservation, protection and promotion. Auckland Council’s Heritage Unit is in the process of taking stock of our significant burial places and revising management strategies to emphasise the unique heritage values of historic cemeteries and to maintain these places for all of Auckland to engage with. Aims of the project, methodology, and preliminary findings will be presented as well as examples of positive outcomes through conservation work, enabled by Council’s grants program.

History of Rock Art Historiography, The case of Northern New South Wales 1837-1922

Amir Moghadam, *University of Newcastle*

This paper intends to look at socio-political grounds defining the academic as well as public understanding of Rock Art. The paper also aims to see if there is any correlation between the mentions of rock art and violent interactions within and between communities between 1837 and 1922. Accordingly, the article is investigating the history of scholarship and understanding the Aboriginal rock arts in the Hunter region, in line with the history of conflicts between aboriginals and settlers in NSW, Australia. The paper will particularly focus on the evolution in knowing of rock arts in archaeological as well as non-archaeological scholarship and the respective implications on how the rock arts was perceived in the given context.

Analyzing the mentioned historiography, the paper takes advantage of the relationship between semiotic (Habermas, 2001) and knowledge theory introduced by Habermas (Habermas, 1972, 1974). From this perspective, one “knows” on the basis of the already known – that is subject to processes of meaning making and normalization. The paper acknowledges that the process of meaning making and normalization may include use of violence. Therefore, understanding language as the realm of meaning making, that sits in close relation with our knowledge, the paper looks at different forms of language that have been used in the public discourse about the aboriginal rock art. Interested in such interaction, the paper discusses how the socio-political context has framed/ formed rock art historiography.

Determining exploitation patterns of sacred animals in the Maya Classic Period in the site of Chinikiha, Chiapas, Mexico through the use of isotope analysis

Coral Montero Lopez, *Jacobs*

The archaeological site of Chinikiha is located in the southern portion of Chiapas, Mexico that has its main occupation during the Late Classic Period (700-850 AD), a period of increasing political competition and alliances formed with the nearby sites of Palenque and Pomoná, amongst others. The Late Classic is characterised by a period of extended exploitation of natural resources by the ruling elites of all Mayan capitals, who also engaged in a series of activities to display their power and wealth, including ritual and political feasting. In this paper, we explore the role of Chinikiha in this framework and the role of animals used in feasting events, mainly white-tailed deer (*Odocoileus virginianus*). Using carbon and nitrogen isotope analysis, we were able to explore differences in access to ritual resources by class and gender. The results suggest that this was an activity where males were consuming more meat than females, especially those from higher classes. We were also able to reconstruct exploitation patterns where deer were mostly an opportunistic catch within the *milpa*, but also hunting parties would have been organised, especially when communal feasts sponsored by the rulers would happen. The exploitation patterns of the Maya of Chinkihá impacted the immediate surroundings, as this study also suggests.

Modern flintknapping in Australia: Stone-flaking in the internet age

Mark W. Moore, *Archaeology and Palaeoanthropology, University of New England*

The 'stone age' is alive-and-well in the 21st Century, with thousands of people making stone tools daily, and some making a living by selling stone knives, specialist stone, or flintknapping tools. The nature of this modern flintknapping movement was influenced by practitioners from four historical trajectories. First were the stoneworkers working within traditional production systems for useful objects, such as gunflints and beads. Second were the flintknappers illicitly producing fake objects for museums and collectors. Third were the hobbyists motivated by curiosity and

personal development. The fourth group—university-based flintknappers—are a rare breed with diminishing influence as the number of non-academic hobbyists increases annually. Here I explore how these historical trends became entangled in the internet age, and how this entanglement is reflected in the recent emergence of the flintknapping movement among Traditional Owners and hobbyists in Australia. The modern stone tool market in Australia is explored, including modern fake and 'flea market' tools, and the tensions around cultural appropriation of flaked-stone tool types by flintknappers in countries with colonial histories, including Australia.

Distribution and exchange of Early Lapita obsidian; A view from Tamuarawai, Emirau Island, Papua New Guinea.

Alix Muir, *Department of Anthropology and Archaeology, University of Otago*

The emergence of the Lapita Cultural Complex in the Bismarck Archipelago (ca 3,300BP), provided the staging ground for one of the most remarkable prehistoric voyaging migrations in human history. Central to the understanding of this movement of people are the networks of interaction and exchange that occurred between communities. This paper outlines research undertaken as part of an honours dissertation that aimed to understand the nature of interactions conducted from Emirau Island during the Early Lapita period through the investigation of an obsidian assemblage. Both a geochemical and technological analysis was undertaken to determine the obsidian sources being utilised within the site and to investigate the reduction techniques applied to these resources. Results of the pXRF analysis demonstrated that the provenance of material was predominantly from the Admiralty Islands with a lesser amount of material originating from West New Britain. The technological analysis determined that there were differences in the intensity of reduction between sources. The results propose two interpretations; that obsidian obtained a social symbolism through the interaction and exchange of this commodity leading to its heavily utilisation, or that due to a decrease in interaction over time sources became more intensively reduced to maximise a limited resource.

Tootsie and me [video]

Ken Mulvaney, *Rio Tinto, University of Western Australia*

It is often joked that for an archaeologist their life is in ruins. Not so for me; having been exposed at a tender age to both the intellectual and physical realities of the discipline, I find a pavilion of tranquillity in the archaeological landscape. For the past fifteen years I have been based at Dampier, on the northwest coast of Australia, surrounded by extractive industry of the last 50 years, but enlivened by the cultural and spiritual landscape of some 50,000 years. Wealth is easily calculated through the commodities market, less readily gauged is the visible and intangible cultural assets that exist in Murujuga (Dampier Archipelago).

On blocks of stone, first laid down 2.75 billion years ago, is the inscribed reflection of people's thinking and culture. Walking this ancient landscape today balances out the impinging industry and political rhetoric. Lessons learnt as a child of archaeology, reinforced by the surrounding grandeur of the Murujuga landscape, keeps one steadfast in face of the incomprehensible destruction of cultural heritage which I first encountered here in 1980.



Ichthyoarchaeological Meta-analysis in Northern Aotearoa: Challenges, Pitfalls, and Golden Opportunities

Reno Nims, University of Auckland

Results from archaeological research provide direct evidence of the critical relationships that have always existed between fisheries and Māori economic, social, and spiritual life. However, archaeological data are complex products of depositional and post-depositional processes. While most comparative and meta-analyses in archaeology would like to assume that taphonomic factors act randomly and do not bias the results of studies with many data points, archaeological records may suffer from systematic biases in preservation, sampling, recovery methods, analytic methods, reporting practices, or yet other factors. In this paper, I re-examine the results of ichthyoarchaeological research from northern Aotearoa New Zealand with an assemblage life history perspective

to explicitly evaluate the possibility of systematic bias in these records and assess whether they are suitable for addressing the question 'How did climate change affect Māori fisheries in Aotearoa New Zealand?' My research also explores methods for comparing datasets of varying data quality to make the most of all available evidence.

Identifying projectile delivery systems using controlled trials on standardized porcelain armatures

Liam Neil, *University of Queensland*
Chris Clarkson, *University of Queensland*
Benjamin Schoville, *University of Queensland*

Identifying the use of projectiles in the distant past has been a major research goal in human evolutionary studies for decades. This is because the evolution of projectile technologies is fundamental to the transition from scavenging to hunting, ensuring greater or more reliable access to meat, and the development of complex technology. In this paper we continue our research on macrofractures formed on the tips of pointed stone armatures used as stabbing and projectile weapons. Here we introduce a novel approach by employing fired porcelain tips (a replica unretouched Levallois point) cast in a mould and attached to foreshafts to better understand the factors affecting fracture on a standardized blank morphology. This approach allows tight control over projectile morphology using a material with fracture properties akin to flint. In this experiment we employed one of the largest samples of points in any study so far ($N = 570$), comparing impact fracture type and size for thrown, thrusting, dart and arrow trials. We statistically compare our results between flint and porcelain tips and between controlled crossbow and hand delivery methods and develop new and more robust associations between impact fracture types and weapon delivery systems.

Let Them Eat Static: Public archaeology and mass media in the twenty-first century

Stephen Nichols, *Department of Aboriginal and Torres Strait Islander Partnerships, Queensland Government*

In the postmodern digital age, fuelled by an explosion in communications technology and the so-called 'information revolution', images and ideas of archaeology

and the archaeological past are everywhere. Some versions of the past have been heavily commoditised, pressed into service for a multitude of consumer-capitalist causes. Archaeology generates billions of dollars of revenue for huge corporatised media conglomerates, churning out endless streams of homogenised archaeological 'product'. Artefacts of every description are bought and sold in their millions through internet auction sites every day. The World Wide Web turns popular books about alien visitors and lost continents into overnight sensations, while the ever expanding blogosphere abounds with fantastic theories and bizarre archaeological conspiracies. In this constantly moving multivocal environment there is no preordained authority for the proclamations of professional archaeologists. In this presentation I will examine the relationships between archaeology and popular media and consider the ways in which Australian and New Zealand archaeologists might approach a new engagement with popular culture in the twenty-first century.

On the Road Again: Learnings from roading and other transect-like projects

Anne O'Hagan, *WSP Opus*

This paper examines a selection of recent archaeological investigations undertaken by the WSP Opus Heritage team during roading projects. It is often thought that such work occurs in previously disturbed areas that are lacking in archaeological potential. Yet, earthworks within road reserves often encounter intact archaeological remains. Roding, and similar transect-like projects, can help fill gaps in archaeological knowledge. At a localised level, such projects can inform our understanding and expectations for neighbouring properties and at a higher level can provide an insight into under-recorded landscapes. These transects further provide a representative sample of the wider archaeological landscape that offers the chance to build up a greater understanding of past occupation. For discussion of these points, this paper will draw upon several roading and transect-like projects undertaken in the Waikato and Bay of Plenty.

Paddling down the highway: Using GIS to explain the archaeology of the Kapiti Coast

Mary O'Keefe, *Heritage Solutions*

Construction of the MacKays to Peka Peka Expressway on the Kapiti Coast, on the west coast of NZ's North Island, presented an opportunity for a large-scale archaeological recording programme.

The expressway route traversed many environmental zones on the coast, and the nearly 250 new archaeological sites recorded during the construction earthworks have contributed to a previously untold story of the occupation of the coast.

GIS was a critical tool in managing the body of data, and in unravelling the significant causal relationship between the people and the environment.

What do we know about Māori rock art?

Gerard O'Regan, *University of Auckland*

New Zealand rock art research had its heyday between the 1950's and 1980's. Our modern understanding of Māori rock art is founded on work that was led out by Schoon, Duff, Ambrose and Davis, with big pictures developed by Fomison, Trotter and McCulloch, and augmented with local reports from the likes of Allingham, Bain, Day and Law. From that time Dunn's *Maori Rock Art* (1972), Trotter and McCulloch's 1981 update of their *Prehistoric Rock Art of New Zealand*, and Thompson's *Maori Rock Art, An Ink That Will Stand Forever* (1989) remain the most accessible volumes on this heritage. Since then scholastic theorising has been thinly spread with the most useful comments to be found in a few rare theses and among Anderson's writings on the South Island. How well, though, do those understandings still hold true?

Despite a low profile within archaeological circles, rock art recording has been far from dormant over the last 25 years. Ngāi Tahu has nearly completed the first phase of a project initiated in the 1990's to re-survey and systematically record South Island sites. The resulting photographic reports will provide a strong base for research initiatives by the iwi who have recently launched a major cultural mapping initiative. The North Island record has also been added to, especially around Taupo, resulting in a nine-fold increase over the number of sites

known in 1981. A three year Marsden funded project is now underway to instigate a Māori driven archaeology of the rock art heritage in that island too. This paper will clarify what we do now know about Māori *rock and discuss what the next steps in developing our knowledge of this heritage might look like.*

Protecting wahi tapu and wahi tupuna in the face of development

Dr Adreane Ormond, *Mahia Whangawehi Protection Society*

Johanna Ormond, *Mahia Mana Society*

An Indigenous ontology and epistemology or understanding of the world, life and self is intrinsically connected to the natural world including flora, fauna and spiritual beings. For many indigenous communities, the geographic habitat on which they locate is central to their identity, spiritual beliefs, cultural practices and economic activity. Māori conceptualise this relationship within the notion of tangata whenua or people of the land and refer to the earth as Papatuanuku — Our ancient mother. The indigenous standpoint is discredited by the colonial settler state which rejects the reciprocal interconnection between indigenous people and the earth and views natural geography as devoid of life and external to human existence and well-being. This binary is reinforced by the settler state civilisation-versus-indigenous primitive lifestyle furthering the social and culture dis—ease between Māori, Pākehā and non-Māori. Issues such as these are commonplace within the rohe or territory of the Māori Nation of Rongomaiwāhine of Te Mahia peninsula of Aotearoa. The principles on which economic development are conducted do not involve the tribal members in meaningful engagement and decision making; overlooks and underestimates the mauri or life force of the land and people and threatens wahi tapu or sacred cultural sites. Challenges such as these, are experienced by many indigenous communities at both local and global levels. This presentation will address the complex issue by discussing anti-colonial activity generated by the Māori grassroots community as they seek to protect their rohe, face the eminent challenges of development and draw insights and lessons from their journey to enable them to sustain the rewarding but often exhausting course.

Smelling the Past, Sensing the Future: Letting an archaeological imagination run wild behind closed doors

Sven Ouzman, *Archaeology & Centre for Rock Art Research + Management, University of Western Australia*

Archives notionally contain the past. But they leak productively into the present – especially in olfactory and tactile ways. These gloomy places allow senses other than sight to come to the fore, powerfully presencing the past, as burdened by colonial and post-colonial baggage. These ‘non-places’ are an amalgam of other places, which combine to create a personal eutopia with dystopic interruptions. Walking down rows upon row of material, one can either invoke a silent contemplative space, or one that shrieks beyond the bounds of hearing. I shall speak of one, hidden archive where I smell the past and sense the future.

Isotopic methods to examine migration and mobility: Australian case studies

Tim Owen, *Flinders University, Adelaide, South Australia*

Donald Pate, *Flinders University, Adelaide, South Australia*

This paper provides an overview of isotopic analyses of human bones and teeth to examine past migration patterns and mobility in pre-contact and historical contexts in Australia. Case studies include the Holocene Roonka and Swanport archaeological sites in South Australia and the historical Old Sydney Burial Ground and St Mary’s Anglican Church cemetery (Adelaide).

Another New Archaeology

Colin Pardoe, *The Australian National University*

Historical narratives are valued, but have proven difficult in Australia. Geographical narratives are providing new opportunities. A spatial basis for archaeology has become the main organising framework of Australian Archaeology. This is particularly apparent in regulatory archaeology, where, guided by legislation, the location of an item of heritage is paramount. GIS and associated analytical tools have allowed us to map distributions of archaeological features across the continent. This

session provides an opportunity to assess whether this has resulted in new questions, directions, or interpretations of the Australian Aboriginal past. To what extent has a focus on spatial analyses furthered our understandings of the archaeological record? This paper presents examples of spatial analyses across a range of different scales from small to large. It draws on different data to explore residential patterning, regional exchange networks and continental biological relations.



A geochemical study of ground stone axe and adze blades from West New Britain, Papua New Guinea

Alana Pengilley, *University of Sydney, Australian Museum*

The colonisation of the Pacific has been the subject of archaeology inquiry since the early twentieth century, however only with the development of fairly recent archaeological investigations are important stories concerning social processes and exchange beginning to be told on the smaller islands within this region. Of particular interest to this research study is the appearance of ground stone axe and adze blades in West New Britain and how these tools can further our understanding of subsistence and mobility patterns of prehistoric people.

The prominence of these artefacts has been well documented in most regions of the Pacific, however their purpose in West New Britain is the subject of fairly new and on-going research. Only appearing on the island within the last millennia, these artefacts diverge from the much earlier axe and adze timeline recorded on the Papua New Guinea mainland. Consequently, we are posed with new questions regarding intensification of land use, changes in raw material use and procurement and developments in new social practices. Ultimately, the appearance of these ground stone artefacts on the island not only represents the introduction of a new technology but potentially a new phase of exchange with different raw materials and items of value.

Through the application of Portable X-ray Fluorescence spectrometry (pXRF) on 81 ground stone axe and adze artefacts from the north and south coast of West New

Britain, this study aims to identify potential source areas and analyse the relationship between function and form. Most importantly, it will shed light on not only a forgotten assemblage but also the application of this type of geochemical technology in a new region of the Pacific.



‘Fun with lithics’ in the Maros-Pangkep regency of Southwest Sulawesi, Indonesia

Yinika Perston, *Griffith University*

Ratno ‘Nano’ Sardi, *Archaeologist, Balai Arkeologi Makassar*

Southwest Sulawesi in Indonesia is home to some remarkable lithic assemblages, from the 200,000 year old cobble tools of Talepu, to the engraved flakes of Late Pleistocene Leang Bulu Bettue, and the delicately serrated ‘Maros points’ of the Holocene *Toalean* period. Local archaeology students involved in the ongoing excavation of some of these assemblages were invited to take part in informal flintknapping experiments during the 2017 and 2018 field seasons. The purpose of these experiments was fourfold; first and foremost, it provided the presenter a means to bridge language barriers and teach the students about the basics of stone artefact recognition and analysis. Second, students gained hands-on experience in stone flaking techniques using local and imported materials. Third, this immersive experience may inspire first-year students to pursue an interest in stone artefact studies in a way that classroom studies alone cannot. Finally, it was an opportunity to investigate the local prehistoric Toalean technology, particularly the possible production techniques of the enigmatic Maros points. The project has also had the unexpected outcome of helping inspire the development of a local souvenir industry—making rough facsimiles of Maros points using power tools and local stone—that helps support a village economy in the Rammang-Rammang area and promotes an appreciation for the region’s prehistory. This talk will be on the informal observations on these uncontrolled and primarily experiential knapping sessions with Indonesian colleagues and students.

Remember, ^{14}C is an environmental isotope - how can we put this to good use in our chronologies?

Fiona Petchey, *University of Waikato, ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Over the last 30 years a number of regional radiocarbon (^{14}C) chronologies for the Pacific have been built using a rigid chronometric hygiene framework. While useful to weed out the worst data, the interpretation of radiocarbon dates in this manner is not always straight forward. Many supposed erroneous dates are caused by differences in carbon production, circulation and uptake. Some of these dates provide valuable information about past environments and, when correctly interpreted, can significantly refine temporal models. In this talk, I present new research into how the radiocarbon dating of shell may redirect our understanding of the timing and drivers behind human movement across the Pacific.

Signature pits

Caroline Phillips, *Caroline Phillips Archaeology*

The standard Maori kumara storage pits are rectangular semi-subterranean structures, often measuring about 4 x 2 metres and 0.8 metres deep. Generally a central line of 3-5 postholes are found in the floor, which originally held up an A-frame roof. Such pits are found by archaeologists throughout New Zealand where kumara were cultivated. However, on occasions variations are found. Major variants include small pits often termed 'bin pits' and cave structures dug into the ground or a bank generally termed 'rua'. However, there are more minor variations. These may relate to a different method of crop storage, or may mark the signatures of individual whanau. This paper looks at a number of variations in the standard kumara storage pits recently found in the Bay of Plenty, including some minor differences that may mark individual choices of design.



Experimentation and simulation: exploring post-depositional movement and technological variability in surface archaeology

Natasha Phillips, *Center for Archaeological Science, University of Wollongong, Department of Archaeology, University of Cape Town*

Justin Pargeter, *Department of Anthropology, Emory University, Centre for Anthropological Research & Department of Anthropology and Development Studies, University of Johannesburg*

Marika Low, *Center for Archaeological Science, University of Wollongong, Department of Archaeology, University of Cape Town*

Alex Mackay, *Center for Archaeological Science, University of Wollongong, Department of Archaeology, University of Cape Town*

As archaeologists we excavate and survey within the archaeological system to extract information about our behaviour in the past. Understanding the history of cultural remains after their discard is often considered secondary to the behaviour that produced it. However, studies involving experimentation and simulation have demonstrated the importance of understanding post-depositional processes, their influence on the organisation and visibility of surface archaeology, and the impact they have on our perception of the past. Lithic miniaturization becomes a recurring and often dominant component in archaeological assemblages from the Late Pleistocene. However, due to their smaller size, their response to post-depositional processes in exposed semi-arid conditions is poorly understood. Recently, archaeologists have noted discrepancies in the composition of Late Pleistocene microlithic assemblages between southern Africa's open-air and rock shelter contexts. For example, although relatively abundant in rock shelters, Late Pleistocene Later Stone Age (c. 44-12 kcal. BP) bipolar cores occur less often in open-air surface contexts relative to freehand cores, leaving researchers to question whether this pattern is due to differences in reduction strategies across a landscape or preservation bias. To explore this discrepancy, we designed an experiment exposing an assemblage of miniaturised lithics to semi-arid conditions for 22 months. Employing both actualistic and simulated methods, this study assessed the degree and rate of horizontal movement

and disaggregation of miniaturized lithics in response to rainfall and slope in the Doring River Valley, located in the semi-arid interior of the Western Cape of South Africa. Our experiment suggests that the differential visibility between freehand and bipolar cores has more to do with behavioural differences across a landscape than preservation bias. Our simulation of long-term attrition raises further questions about the preservation of existing surface archaeology in this landscape, with discipline-wide implications for the global study of surface archaeology in semi-arid conditions.



Preservation vs. Culture- A Locational Analysis of North Island Rock Art

Patricia Pillay, University of Auckland

Rock art is widely distributed across New Zealand taking on various forms across the landscape. Rock art has been extensively studied in the South Island in comparison to the North Island where there have been fewer studies addressing the identification and preservation of rock art. Additionally, New Zealand is characterised by various geological rock types. Therefore, a locational analysis is beneficial for identifying archaeological phenomena such as rock art that are heavily biased by their geological setting, such as in the North Island. Previous studies have indicated preliminary correlations between the distribution of rock art and availability of suitable rock surfaces, based on surveys and information provided by the New Zealand Archaeological Association (NZAA) site recording forms. A quantitative, landscape approach through spatial analysis using Geographical Information Systems (GIS) was adopted to investigate these preliminary correlations. This paper investigates whether people in the past deliberately produced rock art in the North Island on certain geological rock surfaces or if the present day spatial distribution of rock art features are the result of formational and weathering processes.



The role of archaeology in the equitable management of wilderness areas.

Silas Piotrowski, *School of Social Science, The University of Queensland*

Fiona Hamilton, *Melythina Tiakana Warrana Aboriginal Corporation*

Almost one quarter of Tasmania is defined as World Heritage wilderness. The wilderness paradigm may be a useful tool in conserving ecological integrity, but it is problematic in relation to Indigenous people's engagement with their ancestral lands. Conceptions of pristine landscapes tend to require those lands to be people-less in order to sustain such ideals. Although its advocates have lately sought to refine and re-define what wilderness means, they have often done so without the inclusion of Indigenous ways of seeing and knowing. However it is repackaged, the word wilderness generally lacks meaning for people who call these landscapes simply, home. The authority to dictate which actions are compatible with 'wilderness values' rarely lies with Indigenous people. In the Tasmanian Wilderness World Heritage Area (TWWHA), the focus has long been on the conservation of natural values over cultural. Until recently, Aboriginal people have found it difficult, if not illegal, to access their traditional lands and carry out cultural activities. Within archaeology, outdated cultural heritage management paradigms have had a similar effect of removing people from the landscape. The social and cultural connections to places and objects have, in the past, sometimes been ignored by those with the authority to dictate the narratives that landscapes tell. This leads to Indigenous people becoming disenfranchised from cultural heritage management frameworks. Based on our work in Tasmania, we discuss inclusive and equitable land management models that empower Indigenous people to look after their lands and heritage. We ask the question: what is the role of archaeology in designing management paradigms for areas of significant natural and cultural value, which respect Indigenous knowledge?

Archaeology near me? Using simple scripting to geolocate large catalogues of reports

Nicholas Pitt, *independent researcher*

Internet-based databases, such as collections of historic newspapers, heritage registers, site cards and reports all form part of the regular practice of archaeologists in both academic and heritage management research contexts.

However, with the exception of some heritage databases, most online databases relevant to archaeologists in Australia and New Zealand lack geo-spatial information. Instead they rely on text-based searching – which can make finding relevant information on nearby sites difficult, relying on finding relevant key words and place names. Although GIS has offered the means to create geospatial databases for decades, manually creating geospatial information for legacy datasets is usually not feasible when faced with thousands of reports and limited budgets.

This paper presents an attempt to directly address the deficiencies through a semi-automated system to provide geospatial links to existing online report catalogues. Python scripts to extract address and site information from report metadata. Open government sources are then used to geolocate these addresses. The located sites are then presented on a web-based map interface.

This paper also discusses the ethical difficulties with this project, including the competing interests between making information available and keeping sensitive sites safe, and whether its current focus on historical archaeology and heritage sites risks perpetuating an existing blindness to Aboriginal heritage in urban areas.



Palaeolithic rock art in Siberia?

Irina A. Ponomareva, *Griffith University*

Some rock art sites in East Siberia are possibly attributable to a Palaeolithic age. Recent field research led to discoveries that re-open the discussion, although no rock art site in Siberia has yet been chronometrically dated.

In 1949 A.P. Okladnikov assumed a Palaeolithic age for several animalistic figures in the Baikal region, but this was disproved in the recent decades. Two sites, Byrka and Nyukzha, that were discovered in Transbaikalia in the 1980s feature images of extinct fauna such as a rhinoceros and Steppe bison. Excavations under the panels gave fascinating material, however no radiocarbon or other scientific analyses were carried out. In the 1990s, another rock art site, Shaman-Gora, was discovered in Transbaikalia featuring a panel with a herd of Steppe bison and aurochs, although the authors assumed it belonged to the Bronze Age. Again, excavations were undertaken but no scientific analyses were carried out.

In 2017 the author visited the Byrka and Shaman-Gora sites. In the vicinity of the Byrka site, now severely damaged by vandalism, another site featuring a figure of an aurochs or bison was discovered. A thorough documentation of the Shaman-Gora site produced a more accurate tracing which revealed a possible rhinoceros figure unrecognised before. The latter gives another argument to place the appearance of some of the images during the Pleistocene.

All of this points to the importance of further research on the problem of the Palaeolithic rock art in East Siberia. More accurate excavations along with the application of scientific techniques could yield more evidence for establishing the age of the sites. Such research would also draw public attention to the problem of the preservation of rock art in the region, possibly the best pieces of which, unfortunately, have not survived into the present day.

Multi-tasking at Horotiu: Mixed Crops, Pits and Pounamu

Kirsty Potts, *WSP Opus International*

Ian Barber, *University of Otago*

This paper presents the initial findings of a multi-phase pre-European Māori horticultural site, S14/484, identified during the construction of the Te Awa Cyclepath on the banks of the Waikato River at Horotiu. Extensive dry field kumara cultivation is well recorded across Aotearoa, which in the Waikato, and in this site, is often identified through the discovery of distinctive kumara planting pits with coarse sand fill. Less hardy Māori cultigens, such as taro and yam, are encountered less frequently and are rare in the Waikato region. We hypothesize that taro crops with

high moisture requirements were grown in prepared soils and pits in damper aspects of this Horotiu site on the lower terrace of the Waikato River. Storage pits were also encountered at this site, both free standing and intercut, with the intercutting features indicating multiple phases of site use. A range of material culture items were also recovered, including pounamu artefacts that are rarely found in Waikato archaeological contexts. The significance of this site is evidenced by the multi cropping horticulture, persistent land use, as well as the presence of marine shell and the range of material culture items.

Museum in my pocket and Shoe-box archaeology. Engaging Western Australian communities through living archaeology and social media.

Richenda Prall, *Museum of Moving Objects (MOMO) Inc.*

Megan Mentz, *Museum of Moving Objects (MOMO) Inc.*

The Museum of Moving Objects (MOMO) Inc. is a mobile museum based in Fremantle operating in Western Australia bringing history and archaeology to life in schools and communities. MOMO has taken an innovative approach to the interpretation of WA's past through its creative methods of engaging the public with artefacts. MOMO uses social media as a tool to affect and bring about social awareness and change through their mobile workshops and exhibitions.

For people on the street, MOMO provided community engagement activities shared through social media each day to bring the recent Fremantle's King Square excavation to life. For the aged care community of Fremantle, MOMO brings intergenerational archaeology workshops to those living with dementia to enliven and promote memory stimulation.

In 2018 MOMO launched its experimental *Museum in My Pocket* project, going onto the streets to gain a snap shot of living history through objects in individual's pockets, explaining their value and connection to the past and instantly sharing on social media. During National Aboriginal Islander Day of Commemoration (NAIDOC Week 2018) MOMO presented Aboriginal shoebox archaeology in association with Museum in My Pocket to St Pats Community Centre for the homeless in Fremantle,

WA. With permission from the individuals interviewed, posts were shared on social media to promote public awareness and hopefully bring about social change.

By using social media, MOMO aims to increase community awareness of the importance of archaeology to personal histories. This can affect beneficial change by reducing stigma and forming connections and partnerships within broader communities.

Vikings in a Sea of Islands: comparative archaeologies of voyaging and migration from Polynesia and the Northern world

Neil Price, *University of Uppsala, Sweden*

There is a long, curious and problematic history of comparisons between the voyaging cultures of the Polynesians and the Viking-Age Scandinavians - in formal terms since Te Rangi Hīroa's *Vikings of the Sunrise* in 1938, but actually dating at least as far back as the 1880s when the Swedish Viking archaeologist Hjalmar Stolpe began work as one of the first Pacific ethnographers. These links were taken up again by the Hawaiian *po'okela* Herb Kawainui Kāne in the late 1990s, but always more as metaphor than detailed analysis. Since 2013, the University of Uppsala has been exploring more practical, material approaches to the comparative archaeology of the Vikings and the Oceanic peoples, in ongoing work on Hawai'i and beyond that is the subject of this paper. The project focusses on specific themes of mutual relevance, but with a critical awareness of the more uncomfortable heritage of romanticising, outsider perspectives that have afflicted both cultures. Taking respectful inspiration from Epeli Hau'ofa's concept of the 'sea of islands', this presentation will set out a research programme of renewal in Viking studies, and consider the potential feedbacks in the maritime archaeologies of Polynesia.



Analysis of midden shell assemblages using Machine Learning: Preliminary results from the Great Barrier Reef, Queensland

Hisham Abdel Qader, *Faculty of Computing and Mathematical Sciences, University of Waikato*
Peter Reutemann, *Faculty of Computing and*

Mathematical Sciences, University of Waikato

Dale Fletcher, *Faculty of Computing and Mathematical Sciences, University of Waikato*

Cailey Maclaurin, *Faculty of Computing and Mathematical Sciences, University of Waikato*

Ariana Lambrides, *ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Nathan Woolford, *ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Fiona Petchey, *University of Waikato, ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Sean Ulm, *ARC Centre of Excellence for Australian Biodiversity and Heritage, James Cook University*

Midden analysis is one of the most common and time consuming post-excavation analyses undertaken, while shell species identifications are essential to many follow on analyses such as radiocarbon dating. Consequently, the ability to use computers to quickly and accurately analyse midden remains would be invaluable to archaeological research. Bickler (2018) described the use of a pre-trained deep convolutional neural network (Machine Learning) for shell midden analysis using a range of common New Zealand shell taxa. We have developed this further using a deep convolutional neural network with transfer learning for image segmentation and classification (Mask R-CNN) of 12 shell taxa, echinoid and coral remains from assemblages excavated on Lizard Island on the Great Barrier Reef, 250km north of Cairns. Bickler, S. 2018. Prospects for Machine Learning for Shell Midden Analysis. *Archaeology in New Zealand*, 61(1):48-58.



Straits as water barriers or ocean highways: an archaeological investigation into the prehistoric settlement and development of networks of interaction in Manning Strait, Solomon Islands

Charles Radclyffe, *University of Otago*

Straits have attracted interest in culture-historical inquiry in Oceania since the pioneering days of Pacific

anthropology in the early 20th century. Notable examples include Torres Strait in northern Australia, Vitiaz Strait in Papua New Guinea and Bougainville Strait in the northern Solomon Islands. Islands located within sea channels and physically isolated from the mainland were perceived by early ethnologists working in the Pacific as promising settings to study 'bounded' and 'pristine' societies. Archaeological studies have helped reshape this view and have demonstrated that indigenous groups inhabiting these 'landscapes' or 'seascapes' have, in fact, been highly interactive throughout history. Furthermore, this research has underlined how the formation and maintenance of a high level of interaction has played a crucial role in the successful settlement of these typically impoverished and challenging environments. The current study contributes to this body of literature and presents new findings from an investigation of prehistoric settlement, and the development of networks of interaction in Manning Strait. Located in Solomon Islands between the provinces of Santa Isabel and Choiseul, this region has, until recently, received little attention by archaeologists. Here I present the outcomes of a survey and excavation programme undertaken in the region, and geochemical and stylistic analyses of ceramics. These preliminary results are used to build upon sequences of occupation and ceramic styles available for this area of Island Melanesia, and to provide a regional insight into the nature and extent of prehistoric inter-island interaction seen through the movement of pottery.

Weather it Together: Communicating Climate Adaptation for Cultural Resources

Rebecca Ramsay, *Auckland Council and 2017 US/ ICOMOS International Exchange Programme fellow (City of Annapolis, Maryland, U.S.A.)*

The historic district of Annapolis, Maryland, U.S.A. is recognised for its unique and rich heritage resources reflecting one of the first planned cities in the United States. However, with rising sea levels and increasing days of nuisance tidal flooding, Annapolis is now recognised as one of the most at-risk US cities facing the effects of climate change.

In response, the City of Annapolis has embarked on developing a Cultural Resource Hazard Mitigation Plan (CRHMP) through its Weather It Together initiative. The plan, aims to proactively protect and preserve its historic seaport from high tide flooding and rising sea levels,

while adapting and improving the resilience of the City's historic resources.

To communicate the City's planning efforts through an interactive resource an ESRI ArcGIS online story map was developed in collaboration with Michael Baker International. The story map entitled "Landmark at Risk: Protecting the Historic Seaport of Annapolis, Maryland" is the go-to resource, for Annapolis residents and communities facing the challenges of flooding, to learn about the CRHMP and actively engage and provide feedback through geospatial data, social media, and crowdsourcing opportunities.

This paper will discuss the creation and implementation of the Landmark at Risk story map and the increasing opportunities for heritage professionals to communicate with the public through this media platform.



Mapping the Piha Tramline

Rebecca Ramsay, *Heritage Unit, Auckland Council*

Mica Plowman, *Heritage Unit, Auckland Council*

The former Anawhata - Whatipu tramway (the Piha Tramline) covering approximately 100km, was the largest of its type in the Auckland region. The tramway operated over a 47 year period (1874-1921), serving a total of seven timber mills and featured a number of engineering feats including the Piha and Anawhata Inclines. As a result the extent, form and traverse of the tramline was dynamic and variable over time as sections of the tramline were extended, removed, rebuilt and modernised by different mill operations.

These phases and associated sites are recorded across 100s of CHI record forms, 10 NZAA records and six entries in the Auckland Council AUP. In addition, the tramline is well documented in thousands of historical images and publications and physical remains are still present along certain sections. However, the exact route is poorly defined. Recent research as part of the Waitakere Ranges State of the Environment Monitoring Project has attempted to accurately plot the route based on data rationalisation and field survey to improve the overall understanding and management of the site.

Hawaiki revealed: the identification of the ancestral homeland for an Early Polynesian seafarer group to Southern New Zealand based on the Petrology of their artifacts

W. R. H. Ramsay, *private researcher*

E. G. Ramsay, *private researcher*

G. Kerby, *Kiwi North Museum, Whangarei*

G. S. Collett, *private researcher*

Arguably a major problem in New Zealand archaeology has been to identify a particular island, or islands, in the Eastern Pacific from which early Polynesian seafarers departed in c. late 13th/early 14th C to settle in New Zealand.

Previous attempts to define more clearly this ancestral homeland, or Hawaiki, have included oral history and folk lore, mtDNA, linguistics, and stylistic comparisons of artifacts, but as yet no artifact, securely located in a Maori occupation site, has been able to define or source confidently such an island or islands.

Using mineralogy and geochemistry, we identify the Eastern Pacific source for three shaped scoria blocks recovered from Maori occupation sites located in southern New Zealand.

These scoria blocks are aluminous basaltic trachyandesite to phonotephrite with total alkalis 7.3 - 9.6 wt%, TiO_2 2 - 2.3 wt%, MgO 2 - 3.2 wt%, and Al_2O_3 ~19 wt%. Mineralogically, these blocks contain fine crystals of Ti-Al clinopyroxenes, minor olivine (fo ~65), plagioclase (An ~65), minor alkali feldspar, and highly titaniferous magnetites all set in a fresh glassy matrix. Trace element and isotopic data show that they are exotic to both New Zealand and adjacent off-shore islands. We demonstrate that the alkaline volcanic source is either the main island of Tahiti (Tahiti-Nui) or the adjacent island of Mehetia located some 100+ kms to the east-south-east. Predicated on the fresh, hypohyaline nature of all three blocks we are inclined to the volcanically young island of Mehetia, whose most recent eruptive episode is dated <2,600 YBP.

We suggest that these three shaped scoria blocks represent highly significant artifacts carried by one or more early voyaging groups over a distance of 3,000+

kms. We regard these blocks to be among the most important extant pre-European cultural items (taonga) now recognised in New Zealand.



Ngā taonga tuku iho nō ngā tūpuna - Treasures of our heritage handed down by our ancestors

Ripeka Read, *Maori Heritage Team, Heritage Unit,
Auckland Council*

Nico Donovan-Pereira, *Maori Heritage Team,
Heritage Unit, Auckland Council*

Maori world views are shaped from Māori values, traditions and experiences over time. Te Ao Māori is based on the whakapapa genealogical relationships between all things. Māori believe that people are connected and related to the natural world and environment through whakapapa and genealogical links. Māori acknowledge the natural world, and objects within the environment, as having not only a physical presence (tangible), but also as having spiritual and metaphysical (intangible) existence. Therefore Māori have a unique perspective of what constitutes heritage. Heritage can be described from a Māori world view as ngā taonga tuku iho nō ngā tūpuna (treasures of our heritage handed down by our ancestors) imbued with both tangible and intangible values.

Within the western world there has been an inclination to define physical heritage and intangible heritage as two separate things, however from a Māori world view the tangible can only be understood through the intangible, the physical and the spiritual immersing as one.

There is an inextricable link between the tangible and intangible, thus by separating the intangible from the artefact (tangible) it is not only dispossessing and damaging from an indigenous perspective it also has the potential to decimate the traditional knowledge (intangible) that has been passed down with ngā taonga tuku iho nō ngā tūpuna through the generations inflicting further assimilation and cultural loss of mātauranga Māori.

This poster will explore and display the vast contrast between Maori heritage: ngā taonga tuku iho nō ngā

tūpuna and a western paradigm of heritage in a creative and thought provoking way. In turn reinforcing that in considering ngā taonga tuku iho nō ngā tūpuna the tangible and intangible values should always be taken into account together and never in isolation.

Archaeological and cultural analysis at Te Totara: A rare event

Craig Reedy, *Ngati Maru*

Caroline Phillips, *Caroline Phillips Archaeology*

In December 2006, Craig Reedy worked as cultural monitor on an archaeological excavation run by Caroline Phillips at Te Totara near township of Thames. This was one of the few projects for Phillips, in which a cultural monitor knew much about the site involved, or where their information assisted in the interpretation. There are two reasons for this: in most cases the cultural monitor knows little about the place concerned, or little about how archaeology can assist with knowing more about their landscape. This is because universities and other institutions have done nothing to train cultural monitors, unless they have undertaken archaeological degrees – which Reedy has. Maori organisations have not fully involved their monitors in the histories of the place and do not have the resources to do so. Although Maori organisations may know something of the history of the places being examined, until recently when the legislation changed, contact between the archaeologist and Maori was largely limited to the cultural monitor. This may change and develop with this new legislation. I certainly hope so. In this paper Reedy and Phillips talk about their experience at Te Totara near Thames, and reflect on the issues around difficulties in collaboration in New Zealand.

Managing data and the archaeology of archaeology: a case study from Bahrain

Claire Reeler, *University of Sydney*

PhD research on the changing settlement patterns through time on Bahrain as expressed through the lithics became, as may be expected perhaps, a morass of unpublished reports, old maps (some with pins stuck in them dating from the 1950s), collections in cardboard boxes in the attic storerooms of museums (with faded hand-written notes of explanation) and assorted paraphernalia. Converting this into a format for useful analysis seemed

like undertaking the “archaeology of archaeology”. Use of a Heurist database, with its unique capacity to capture both space (including visual depictions of geospatial data) and time (including date ranges, radiocarbon and approximate dates – displayed on a timeline), became a fundamental part of the analysis, as well as creating a lasting resource which can be used by researchers interested in the archaeology of the Gulf region. In this paper we explore how Heurist was used to help manage these disparate sources and provide coherence for, as well as greatly facilitating, analysis of the archaeological data from sites in Bahrain. The submission of an online appendix to the dissertation, with examiners able to login remotely to explore the project database is also covered. These issues are of broader relevance to the ways in which researchers can use digital tools to facilitate research, whilst preserving data online for future reference.



Using Heurist to manage archaeological and anthropological data

Claire Reeler, *University of Sydney*

Heurist is described as a knowledge management system. Since it was developed by Dr Ian Johnson, an archaeologist, it is very compatible with archaeological and anthropological data. Heurist’s unique abilities to work with spatial and temporal data are showcased in this presentation of two projects from Bahrain – firstly an archaeology PhD for the University of Sydney on changing settlement patterns and lithics, and secondly the nomination project for the UNESCO World Heritage Site – Pearling, Testimony of an Island Economy. Both the analysis and presentation aspects of Heurist are highlighted, as well as general data management principles. As data management of heritage data becomes both a legislated requirement as well as a fundamental part of funding proposals, tools such as Heurist become critical components for anyone working with this data. Awareness of the capacity of these tools is important for all researchers and anyone working with heritage data.

Investigating a South Vanuatu interaction sphere: pXRF analysis of oven stones from Aniwa Island

Christian Reepmeyer, *College of Arts, Society and Education, James Cook University*

James Flexner, *Faculty of Arts and Social Sciences, The University of Sydney*

Stuart Bedford, *Archaeology and Natural History, The Australian National University*

Denise Elena, *Vanuatu Cultural Centre, Isavai Village, Aniwa Island, Vanuatu*

This paper presents preliminary results from fieldwork on Aniwa island, Vanuatu, geochemically investigating heat retainer and oven stones. Heat retainer and oven stones are abundant in archaeological sites in Vanuatu and are essential items for subsistence activities. They are commonly made from volcanic rocks as these are more resistant to frequent heating and cooling cycles, as well as their superior performance in retaining heat over longer periods. Volcanic rocks are an abundant resource on most island in Vanuatu with surface outcrops easily accessible. Aniwa island in southern Vanuatu, however, is different as it is a low-lying coral limestone island with no volcanic surface outcrops available. Aniwa is uniquely situated to understand inter-island exchange relationships and raw material interaction spheres in southern Vanuatu as all volcanic rocks recovered from archaeological sites on Aniwa have to be treated as imports from neighbouring islands. This paper will concentrate on oven stones excavated from the Aniwa Mission Station, which showed recurrent occupation since approximately 2500 cal. BP. It enabled us to understand changing inter-island exchange relationships with neighbouring islands of Futuna, Erromango and Tanna.



Realising the potential of non-destructive pXRF analysis in old museum collections

Michelle Richards, *Australian National University*

A new method for using non-destructive portable XRF to geologically classifying volcanic rock types is presented in this paper, which can aid in provenance

and geochemical groupings and inform archaeological models used for understanding exchange systems in prehistoric social networks. This method is demonstrated to be effective on a large number of stone adzes and food pounders held in old museum collections (1890s-1970s). These collections include the British Museum, London; Pitt Rivers Museum, Oxford; Cambridge Museum of Archaeology and Anthropology; Bishop Museum, Honolulu; Musée Tahiti et des îles – Te Fare Manaha, Papeete; and Kon Tiki Museum, Oslo. The collectors, the history and past interpretations of these collections are highlighted for their significance to the history of Pacific archaeology. In particular, a geochemical study of the adzes and pounders will be compared and contrasted with the results from recent excavations to examine the values these objects have for understanding historic and prehistoric pasts.



Calling all #Twitterstorians and #Archaeotweeps! Spreading the word about Australian archaeology via a social media conference – the case of #Archaeotweet2018.

Melissa Riley, *University of Tasmania*

Social media has become an increasingly important medium through which archaeologists and historians communicate their messages. It is a way of engaging with colleagues both within and beyond the profession, including educators who have both a general and vested interest in learning about archaeology. Recent research indicates that amongst the social media platforms available, teachers consider Twitter to be a highly valued professional learning space where research can be disseminated, knowledge can be shared and within which lively professional debate can be engaged. This in turn presents an opportunity for archaeologists to send their messages to a highly engaged and receptive audience.

The Australian Curriculum – History has now been either adopted or adapted in every state or territory in Australia, and it is an archaeology-friendly curriculum. This means that History teachers around Australia are teaching about the methodologies of archaeologists, and their work in uncovering our continent's ancient

past. These are not topics with which teachers would necessarily have had any experience, and formal teacher professional learning in this area to date has been patchy at best. Enter: Archaeotweet 2018, a Twitter conference about archaeology designed specifically for teachers. This paper will present a summary of the good, the bad and the ugly from the first-of-its-kind Twitter conference, and the potential for further bridging the gap between archaeologists and those trusted with teaching their messages.

Archaeology of the lower Moorabool River valley, Victoria

Kasey F. Robb, *Biosis Pty Ltd*

Martin Lawler, *Biosis Pty Ltd*

William Truscott, *Biosis Pty Ltd*

Development works necessitated the largescale investigation of a section of the Moorabool River valley in southern Victoria. Surface artefacts had previously been recorded within the valley but its formation resulted in a series of river terraces, with the potential for deep and complex stratigraphy.

Initial investigation established a wealth of surface and shallow subsurface artefact deposits, however as rivers and waterways are dynamic environments, deeper sediments on the river margins required further investigation. Unique approaches were developed to investigate these deeper sediments, and a number of mechanical excavations were carried out to depths of up to 7 metres. In conjunction with digital models, these excavations allowed insights into the development of the river valley, from the late Pleistocene to the present day, as well as insights into how Aboriginal people utilised the broader landscape, including some of the earliest evidence for occupation in this region. The methodology and results will be discussed here, providing a context for further investigation within the region.

The bioarchaeological implications of human movement: testing the Osteological Paradox in Victoria, Australia, 1853 to 1916

Phillip Roberts, *Federation University Australia*

Georgia Roberts, (presenting author), *Monash Indigenous Centre, Monash University*

Fuelled by a desire for gold, the Victorian gold rush began in 1851, profoundly changing the social, economic and environmental landscape of the Australian state of Victoria. These rapid changes in disease ecology directly influenced the health experience of the population, recorded due to the introduction of public registration in the state in the early 1850s. These records, along with hospital administration records of the Bendigo Base and Royal Melbourne hospital, present a relatively robust record of the disease experience, unmodified by modern medicine: this data therefore represents a natural experiment ultimately driven by a shifting demographic and socio-economic environment.

This natural experiment (1853 to 1916) therefore presents a model in which to test unresolved theoretical bioarchaeological questions, including the *Osteological Paradox* (Wood et al., 1992). This presentation explores this question through two case studies examining changing rates of tuberculosis and syphilis – two diseases that may progress to skeletal involvement and thus be visible within the archaeological record. Mortality rates of acute forms of these diseases in children – tubercular meningitis and congenital syphilis – were used as a proxy for disease incidence due to associated high mortality rates and rapid disease progression. This study has demonstrated that this methodology presents an effective tool to inform ongoing theoretical debates, helping to understand how skeletally manifested infectious disease can be used to interpret the experiences of past populations.

Reference

Wood, J.W., Milner, G.R., Harpending, H.C., Weiss, K.M., 1992. The Osteological Paradox. *Current Anthropology* 33, 343–370.

Human responses to sea level changes: an example from Stradbroke Island, Moreton Bay, Southeast Queensland

Richard Robins, *Everick Heritage Consultants*
Errol Stock, *Triple-E Consultants*

Some 30 years ago Neal and Stock (1986) published details of an excavation at Wallen Wallen Creek, on the west coast of North Stradbroke Island, Moreton Bay, that yielded a sequence of ages for human occupation ranging from the late Pleistocene (20560 CRA) to the

Late Holocene (450 CRA). It was the first, and remains today, the only site in coastal southeast Queensland with occupational evidence commencing in the Pleistocene and extending through to the Late Holocene. Dating issues relating to the lower deposits of the site have overshadowed the important archaeological story the site contains relating to the transformation of Stradbroke Island from an inland site on the edge of a coastal riverine plain to a coastal site on the edge of Moreton Bay. Using available evidence, this presentation discusses the Aboriginal responses to environmental changes that occurred and the possible implications for existing models of Aboriginal response to environmental change.

Conceptualising islands - Not Isolation v integration, rather constraints as a mechanism for cultural opportunity

James Robinson, *Heritage New Zealand Pouhere Taonga*

Forsberg's 1963 definitions of what happens on islands are based around varying degrees of environmental constraint. His definitions are still valid for the natural world which is bound by nature, but for the human world they are mediated by our unique ability to transcend nature. Within this context I will use examples of inshore and offshore islands with varying degrees of circumscription within the northern horticultural region of the New Zealand archipelago to argue that Forsberg's environmental constraints can influence but not determine the nature, timing and extent of Maori settlement.

Although the nature and timing of island settlement by Maori may have followed different trajectories depending on the unusual mix of opportunities and difficulties inherent with living on islands with varying degrees of isolation, it is argued that human use of both inshore and offshore islands was entirely contingent on what was happening politically, economically and socially within Māori society in general.

What makes islands so important to archaeologists is how the cultural response to Forsberg's environmental factors can create a sequence of 'presence and absence' scenarios on significantly circumscribed islands that are highly visible to us and which therefore allow for a discussion about change over time in the Māori history of this coastal region.

Archaeology and Maori

David Nikorima Robson, *Heritage New Zealand Pouhere Taonga*

In Hauraki there is a taniwha named Ureia, a sea mammal and among his talents was an ability to portend the arrival of misfortune for the local tribe through his exuberant display in the nearby sea. In 1975 the tribes were to observe a taniwha on the land as an omen of the impending desecration of their wahi tapu (special places). The field of archaeology promoted legal protection for cultural sites in Aotearoa/New Zealand during the 1960s and 70s and claimed the resource as archaeological and a scientific resource and that they were the authority over this resource. The authority came from legal status of archaeology with Historic Places Act 1975. The HPA was the taniwha directed by NZHPT and implemented by archaeologists who preceded development and subsequent destruction of Maori heritage. Treaty of Waitangi claims during the 1970s and 80s saw the inclusion of Maori cultural values in the Resource Management Act 1991 and the processes of consultation, kaitiakitanga, assessments of environment effects, avoidance, remediation and mitigation, association of Maori with their sites, ancestral lands, wahi tapu, taonga. The RMA brought about challenges from iwi and hapu to the archaeological authority of the HPA or destruction of Maori heritage under HPA in RMA processes. The archaeological provisions of the Historic Places Act 1993 provided for inclusive and mandatory consultation, assessment of the archaeological, Maori and other values of the archaeological resource and the assessment of the effects of the proposal on those values. These provisions only pertain to archaeology but also take into account the association of Maori with their ancestral lands, sites, waahi tapu, taonga

I have 28 years' experience at the interface of archaeology and Maori conflict and recognition of archaeological and Maori cultural values. Less than 5% of archaeological sites whether recorded or unrecorded, unknown or suspected and other traditional site are on Maori owned lands. A motivation for me has been to share tools with Kaitiaki to assist them in managing their special heritage places.

Gummingurru and Calga – place narrative and cultural landscape management practice

Annie Ross, *The University of Queensland*

In his book *Entangled*, Hodder (2012) offers a framework for exploring relationships between people, things and places from the perspective of the things and places themselves. This challenges approaches to CHM that privilege materiality over socially and spiritually embedded complexities of relationships between people and heritage. In this paper I analyse how my entanglement with the Gummingurru stone arrangement site, a former men's initiation site that today is a place of reconciliation and sharing, helped me to become entangled with the Calga Women's site and thereby to understand the complexity of interconnections between women, men, ancestors, Creator Beings, and place/landscape. Tweetable summary: People, things, stories and relationships are all entangled in understanding the attachment between Aboriginal people and Country at Gummingurru and Calga.



Identifying submerged archaeology in the Dampier Archipelago, WA

Peter J. Ross, *Flinders University of South Australia*

High-resolution airborne laser scanning and airborne laser bathymetry have been acquired for ~2500 square kilometres of Western Australia's Dampier Archipelago as part of the ARC Discovery Project "Deep History of Sea Country". The project aims to identify archaeological sites that are now submerged due to rising sea-levels over the past 18,000 years. The Dampier Archipelago was chosen as a test area because it features the highest concentration of land-based archaeological sites in Australia, so it is likely to contain submerged sites given the continuous nature of inundation in this part of Australia since the last glacial maximum. This presentation provides initial results of PhD research to develop inductive, statistically based predictive models based on airborne LiDAR acquired digital signatures of hunter-gatherer archaeological features. Before making use of LiDAR to search for hunter-gatherer sites in

unsurveyed areas, a digital signature for these types of archaeological sites must be identified to characterise similar features. While airborne LiDAR has led to discoveries of megalithic structures and bare-earth modifications (e.g. canals, house foundations, etc.) in many areas of the world, a similar application to hunter-gatherer sites remains elusive. This is because the nature of these types of sites leave only slight traces on the natural environment.

The Importance of Islands – From Whakahau to Ganumi Bara

Michael J Rowland, *James Cook University*

In 1970 I commenced undergraduate study at Auckland University and in 1973 undertook archaeological Masters degree research analysing components of Roger Green's excavations at the Archaic site of Tairua on the Coromandel coast. In interpreting results from Tairua in a broader framework I came across a copy of Robert MacArthur and Edward Wilson's 1967 book *The Theory of Island Biogeography* which made a significant impression on me that has continued to the present. I subsequently undertook excavations on Slipper (Whakahau) Island and in my Masters thesis developed an argument for the importance of offshore islands in New Zealand prehistory. Since leaving New Zealand in 1976 I have worked on Lakemba Island, Fiji; the Torres Strait Islands; Dunk Island; the Percy Islands; the Whitsunday Islands and substantively on the Keppel Group of Islands (Ganumi Bara) off the Queensland coast. Thus, for nearly 50 years I have continued to be fascinated by islands and how they were occupied and used. While the 'island concept' has been critiqued both in archaeology and other disciplines I believe islandisation is critical to understanding the human past. In this paper I consider two features of islands. In the case of Slipper Island its potential as a 'stepping stone' island and in the case of the Keppel Islands the nature of island adaptation and extent of the island's isolation from the mainland.

An investigation of Māori gardening practices at the Okurupunga stone rows, Wairarapa

Matt Ryan, *Victoria University of Wellington*
Lara Shepherd (presenter), *Museum of New Zealand Te Papa Tongarewa*

John Carter, *Victoria University of Wellington*
Aline Holmes, *Victoria University of Wellington*
Ben Hines, *Victoria University of Wellington*
Margaret Harper, *Victoria University of Wellington*

We present research on the Okurupunga stone rows on the Wairarapa coastline in order to shed light on early Māori agricultural practices. These long stone mounds in shallow trenches were formed around 600 years ago but the area was abandoned prior to European arrival. We are using an integrative approach incorporating analyses of microfossils, such as pollen and phytoliths, macrofossils and DNA from sediment samples taken at different depths to determine the plant remains present on and around the rows. One of our aims is to try to determine whether crops were planted directly on the stone rows, to provide heat and extend the growing season, or between the rows, with the stones providing shelter. Our data to date indicates the presence of both kumara and gourd remains, making this site the most southerly record of gourd cultivation.



The All Inclusive Archaeology Student: the first steps of Enabled archaeology research at Flinders University of South Australia and perspectives about how accessibility, inclusion and diversity make for a stronger generation of future archaeologists.

Clara Santilli, *Flinders University*

The central aim of this presentation is to explore how we can expand archaeology beyond a privileged space that allows wider participation and community engagement at a university and student level at the Flinders University of South Australia. Considerable progress has been made towards accessibility awareness and inclusion within community and public archaeology in an international context, this presentation aims to expand on what is being undertaken in student research projects. We aim to highlight novel cross-disciplinary approaches and lived experiences of past and present students at Flinders University and how applying lessons have enabled us, as the future practitioners of archaeology, to create a more inclusive environment for our diverse student population. In creating a conversation that

allows us to openly explore the challenges and obstacles faced by students, we are investigating ways to incorporate social justice into the discipline of Archaeology at Flinders. Lecturers have recognised the need to support our student population at every level of study and created a dedicated staff position to support our student body. In addition, Flinders University, in collaboration with the Flinders Archaeological Society and the Enabled Archaeology Foundation in the UK, have advocated to innovate change, cultivate acceptance and become world leaders in all-inclusive Archaeology. This presentation highlights our progress in our fight for social justice within Archaeological spaces that we inhabit. By developing inclusive strategies at a student level, it is hoped that a program of inclusivity can continue within a workplace environment.

Celebrating a Tiny Island

Tom Sapienza, *Extent Heritage*

In 2011 I spent six weeks on Nukunonu, one of Tokelau's atolls. It is a tiny island, the local community inhabiting a 2500 x 250m land area. While I was there I participated very little in archaeological activities, and instead made my way as a spider-hunting assistant. My experiences there have had a disproportionate influence on my work, considering how short time my time on Nukunonu was and how small the place is. This presentation explains how my time in this place still influences how I approach fieldwork with small and remote communities, and packing for a trip.

Tweetable summary: Moonlighting as a spider hunting assistant on Tokelau changed how Tom Sapienza approached archaeology on remote islands and in close-knit communities.

Beginners guide to moving small heritage buildings – Williams Rees 1864 Meat Shed, Lake Wakatipu

Matthew Schmidt, *Heritage New Zealand Pouhere Taonga*

William Rees is considered by many to be the founder of Queenstown given that he established the homestead for his pastoral lease on its shores in 1860. However, things changed dramatically for Rees in 1862 when the discovery of gold on the Arrow and Shotover Rivers was

announced. This event saw part of Rees pastoral run on the lake declared a goldfield with his original homestead land parcel quickly becoming surrounded by miners and related commerce. Rees therefore moved his homestead to the Kawarau Falls in 1863, keeping his land by the lake to run a very successful goods supply company. At the falls he built a beautiful wooden homestead villa and a number of ancillary buildings. The homestead and all of its buildings survived until 1960 when after this time one-by-one they were gradually demolished. In 1987 the homestead villa succumbed to demolition for campsite development leaving only the Dairy and Meat Sheds both built in 1864. These small buildings are built of schist and have the original wooden roof shakes beneath their corrugated iron roofs. Both buildings were at risk of being demolished for a development proposal back in 2003, but through discussions with the developer and then later owners of the property, Heritage New Zealand successfully negotiated the retention of the Dairy in-situ and the preservation of the Meat Shed by moving the building next to the Dairy on a reserve created for their preservation.

This paper presents a history of the William Rees and his Kawarau Falls Homestead and shows how the Meat Shed was successfully moved as a partnership project involving the land owner, Heritage New Zealand, various heritage professionals and contractors.



Landscape and its role in the detection of Holocene sites in the Central Lowlands of the Hunter Valley and the Cumberland Plain

Alexandra Seifertova, *University of Sydney*

This poster aims to address the inconsistent use of geographical information systems (GIS) within cultural heritage management (CHM), the absence of cultural variables within archaeological predictive modelling (APM); and subsequently provides a means in which to improve the identification of site location. The use of APM in CHM is integral to the identification of prehistoric sites globally. APM allows for landscapes to be examined on a macro scale, allow for quick identification, and the subsequent retrieval and salvage of sites. The aid of GIS is crucial for accurate mapping and spatial relationships

to be examined, yet there appears to be an apparent absence in a consistent use of GIS across CHM in archaeology. Furthermore, there is a strong reliance on APM to investigate environmental variables in relation to site location, a factor resulting in an absence of APM using cultural material such as art, lithics, and non-material information as potential site variables. In order to address these two issues in depth, an examination of Holocene sites in the Central Lowlands of the Hunter Valley and the Cumberland Plain in New South Wales, Australia was conducted using ArcGIS. The overall results of this thesis aimed to demonstrate that to improve the accuracy and prediction rate of APM there needs to be a reconsideration of the variables used when identifying possible site location.



Gunflints from obsidian? An experiment to interpret the function of a specific type

Bengi Basak Selvi, *School of Historical and Philosophical Studies, The University of Melbourne*

The stone tool making in the later prehistoric periods of the Near Eastern cultures has been overlooked in contrast to the Neolithic and Palaeolithic. The broad aim of my research is to techno-typologically analyse the assemblage from the Early Bronze Age to Iron Age periods of a settlement from north eastern Turkey. In this presentation I will focus on and discuss the production techniques of a rare type tool found in numerous excavations in Eastern Turkey, and interpreted as gunflints regardless of possibility to be associated with prehistoric contexts.

The replication experiment will be conducted with the cobbles from the quarry that has been exploited during these time periods by the settlers. The original size tool will be produced and tested on the organic findings of the same context. Both hard and soft hammer techniques will be tested to reflect the scar patterns' accuracy together with pressure flaking on margins' retouch. Additionally, the production sequence will allow us to understand the limits of the intention of the knappers' and their decision making how this type has been made. Through this experiment I will be aiming to address the possible function of the tool type, as the artefact found in the settlement knapped by obsidian which eliminates the possibility of gunflint.

2400 years of dynamic settlement history in the Massim islands of eastern Papua New Guinea from Lapita through to historic contexts

Ben Shaw, *University of New South Wales*

Emily Hull, *University of New South Wales*

Vincent Kewibu, *University of Papua New Guinea*

Simon Coxe, *Monash University*

Jemina Haro, *National Museum and Art Gallery of Papua New Guinea*

Kenneth Miamba, *National Museum and Art Gallery of Papua New Guinea*

Recent fieldwork in the Massim islands of eastern Papua New Guinea has confirmed a Late Pleistocene time depth for human colonisation and expanded the known distribution of Lapita settlement to include the Louisiade Archipelago. Subsequent cultural traditions over the last 2000 years have also been more defined which ultimately led to the appearance of the distinctive 'southern Massim' cultures. In this paper, multiple lines of evidence are considered to model how adaptive strategies for island settlement and interaction have shaped the long term development of cultural diversity in the Massim.

Comparative Review of Exchange Networks in the Solomon Islands with a focus on the Western Solomons

Peter Sheppard *University of Auckland (NZAA Member)*

As Nicholas Thomas (1991) has observed the 19th century cultures of the Western Solomon Islands illustrate the over simplification created by simple binary distinctions of gift economies and social exchange versus market based trade in commodities. Archaeological models of 'trade and exchange' tend in turn to consider transfer of materials as forms of commodity exchange. In the Western Solomons shell 'currencies' were elaborated to a very great degree allowing the near commodification of exchange yet these 'currencies' were not simply units of asocial value. They were intricately entangled with systems of identity and symbolism. In this paper I review the archaeology and ethnohistory associated with these 'currencies' and consider briefly how they compare with developments elsewhere in the Solomon Islands.

Thomas, Nicholas 1991. *Entangled Objects: Exchange, Material Culture, and Colonialism in the Pacific*. Harvard University Press, Cambridge, Mass.

Hunter-gatherer economies along the Newcastle coastline: An analysis of a shell midden site from the Late Holocene.

Megan Sheppard Brennand, *Extent Heritage*

Until relatively recently, shell middens have been overlooked as culturally rich sites that can inform archaeologists on many aspects of the past. In depth analyses of all features of a site are needed in order to gain an understanding of the people who created them. Analyses that examine both the ecological and economic aspects of sites through the use of quantitative data have been promoted via detailed research of coastal shell deposits in South Africa and California. Although the application of this type of approach has not been as widespread in southeast Australia, the foundational work on which to build more detailed coastal archaeological research and midden analysis comes from Attenbrow (Attenbrow 1993, 1995, 2010a, 2010c, 2011) and Sullivan (Sullivan 1982, 1984, 1987). This study, through a holistic and methodical approach, seeks to provide a material based analysis of hunter-gatherer interactions with the environment along the NSW coastline during the late Holocene. The case study of the Birubi shell midden is located near Port Stephens in NSW and was systematically excavated and recorded by Prof. Len Dyal (then of the University of Newcastle) in the 1970s. The results from the quantitative analysis undertaken for this study demonstrate that the hunter-gatherers of Birubi sustained a diverse coastal economy. This study aims to provide a dataset, following the framework of Sullivan and Attenbrow, which can be used alongside other similar studies in order to build up a more comprehensive understanding of subsistence economies along the NSW coastline in the Holocene.

The Deep Time landscape of Purlikunti and the Juukan 2 Site: Pleistocene human occupation environmental change and connections in the central Pilbara, Western Australia

Michael Slack, *ARC Centre of Excellence for Australia Biodiversity and Heritage, James Cook University*

W. Boone Law, *School of Biological Sciences, University of Adelaide*

Harold Ashburton, *Puuntu Kunti Kurruma and Pinnikura People*

R.J. McKay, *Puuntu Kunti Kurruma and Pinnikura People*

Victoria Anderson, *Rio Tinto*

This paper presents the results of archaeological excavations at Juukan 2, a rockshelter situated in a culturally significant complex in the traditional lands of the Puuntu Kunti Kurruma and Pinnikura (PKKP) peoples of the central Hamersley Ranges. The large-scale excavations at Juukan 2 have produced a high-resolution chronology and a rich cultural assemblage of stone artefacts, faunal remains and other well-preserved organic material spanning over 45,000 years. Together, the archaeologists and traditional owners contextualise the significance of this site through a discussion of the site chronology, archaeological patterns, interpretations, cultural connections and ultimately how people derive meaning from this ancient place.

Reconstructing a peopled landscape in the Pilbara

Michael Slack, *ARC Centre of Excellence for Australia Biodiversity and Heritage, James Cook University*

Glen Murray, *Banjima people*

Allan Ewan, *Ngarlawanga people*

Jade Pervan, *BHP*

W. Boone Law, *ARC Centre for Biodiversity and Heritage, University of Adelaide*

Annunziata Strano, *BHP*

Garran Stevens, *Banima People*

The Djadjiling ranges span an impressive 20km of the central Hamersley plateau and whilst within the traditional country of the Banjima people, are close to three other traditional lands (the Nyiyaparli,

Ngarlawanga, and Yinhawangka). They are a physical landform of rugged ironstone hills and gorges; they feature cultural places including Mt Robinson, Gaguna and nearby Barimunya; they are covered in a density of cultural heritage locations, some rare for the Pilbara that includes rockshelters, artefact scatters, stone arrangements, some of which feature art and other significant cultural materials, but that often are only researched in a piecemeal way. Overlying these places is an ongoing connection to the country and the meaning of these places.

In this paper we attempt to reconstruct the jigsaw of this cultural landscape through a collaborative and balanced approach between archaeology and cultural knowledge, intangible and known.

Everything you thought you knew about the history of Australian archaeology is wrong

Matthew Spriggs, School of Archaeology & Anthropology, The Australian National University

There has been a general orthodoxy developed that sees a major break in the history of Australian archaeology around January 1956 with Mulvaney's excavation at Fromm's Landing. This separates the bad old archaeologists of the past, primarily colonialist amateur stone artefact collectors, from the good new and more culturally sensitive scientific and university-trained archaeologists of the present era. While researching the wider links of Australian archaeologists with regional and wider networks I came to realise that there was a lot more 'professionalism' around between the wars than is ever credited. Leaving aside the towering figures of Tindale and McCarthy, the paper examines in particular the careers of: DA Casey as an Australian-born highly trained excavator who returned to his natal country in 1933 and was active throughout the 1930s before becoming John Mulvaney's 'secret weapon' in his 1950s and 1960s excavations; D.S. Davidson, a fully-university trained American archaeologist who spent nearly 4 years in total in Australia 1930-1 and 1938-40 and published over 30 papers and full monographs on aspects of Australian archaeology and material culture; and finally H.V.V. Noone, stranded in Australia during most of WWII who was a key figure in French palaeolithic artefact classification before the War, and who had a profound effect on how later Australian archaeologists looked

at stone tools that has lasted to the present (albeit largely unacknowledged). I do not see any evidence of a profound break in the mid-1950s and feel we need to acknowledge that 'scientific' archaeology in Australia has a much deeper lineage.

Roles, responsibility & observations – the perspective of a Cultural Monitor & Cultural Liaison Person.

**Moko Tauariki, Ngati Naho, Waikato Tainui
Makere Rika-Heke, Heritage New Zealand Pouhere
Taonga**

The purpose of the Cultural Monitor role is to observe activities associated with development on a site, to evaluate & assess activities carried out on site, to report back to hapu/iwi with regularity and to convey Intel about what transpires for the duration of a development. Their role is to be the eyes and ears for others who cannot be onsite, to implement cultural protocols should the need arise, to ensure that all activities are carried out in a culturally sensitive manner and to provide cultural advice to contractors and Project Team members including Archaeologists and their Assistants. They are in effect, conduits for the people directed by the people. A Cultural Liaison by comparison is someone from within that serves as a link between their community (Iwi/Hapu) and other parties. A Cultural Liaison helps a Developer and or their Agents understand the values and norms of the Iwi/Hapu and helps Iwi/Hapu members negotiate regulatory and project structures.

This paper touches on a series of personal observations concerning the interaction Maori have had with archaeological practices as observed carrying out Cultural Monitor and Maori Liaison roles working with NZTA and Waikato-Tainui over the last 10 years. It explores attitudinal shifts over time and beneficial outcomes of active engagement. Lastly, this presentation identifies gaps; chiefly the mismatch of values and how those gaps are being addressed for better mutual outcomes.



Addressing Australian/South-East Asian culture contact through rock-art: a comparative attribute analysis of rock-art between Island South East Asia and The Kimberley, Western Australia

Matthew Tetlaw, *University of Western Australia*

Culture contact is a primary theme in archaeological research, where instances are best understood in the colonial period. Evidence for this cultural praxis is primarily the transfer of material objects which are solely recognisable as being from a particular culture, only then found within the associated culture's material remains. Rock art, in tandem, is a piece of material culture which directly expresses the cultural ideas and concepts of its makers. Consequently, this allows the assumption that design elements within rock-art can themselves also be used as an indicator of cultural contact. Within Australia, there is little question of contact between South-East Asia (SEA) and Northern Australia outside of two known points: Initial colonisation of Sahul, 65,000BP (Clarkson et al. 2017) and the historical 'Macassan' period ~1600CE (Taçon and May 2013). Given recent references to the similarity of rock art between these regions, (Aubert et al. 2014; O'Connor et al. 2010; Fage and Chazine 2009 and others) a more systematic analysis of cultural connections is warranted. This presentation explores the results of an honours thesis conducted in 2018, focused on the rock art of SEA and the Kimberley. It seeks to challenge the passing references made to the similarities of rock-art between these areas through a systematic attribute analysis and comparison of motifs and their attributes within the rock-art corpus. Establishment of contact outside of known points challenges the idea of First Australians as isolationist following first colonisation of Sahul. In addition, it also evaluates rock-art design elements as useful indicators of culture contact. This project also contributes to underdeveloped rock-art research in the SEA region.



Turtles, tracks, and tales: mapping moving through a narrated landscape

Jaydeyn Thomas, *School of Social Science, The University of Queensland*

Annie Ross, *School of Social Science, The University of Queensland*

Conrad Bauwens, *Gummingurru Aboriginal Corporation*

Shannon Bauwens, *Gummingurru Aboriginal Corporation*

The representation of the meaning of the stone arrangements at Gummingurru, which exist within the Bunya Mountains Cultural Landscape, has changed throughout the multiple archaeological investigations undertaken over the last 20 years. Most recently, the Aboriginal embodied understanding of this place has been explored using phenomenological counter-mapping techniques, particularly through the incorporation of animation as representations of the movement of yuree (totemic) stories and of the stones themselves. The turtle motif on this site exemplifies the movement of intangible heritage through a tangible site, place, and multiple entangled landscapes; echoing the movement of *people* throughout wider ceremonial and cultural landscapes. In this paper we document the phenomenological techniques used to ensure that archaeological representation incorporates Traditional Custodian narratives.

Archaeologists have worked with the Traditional Custodians to manage the Gummingurru site. Brian Tobane, a now deceased Jarowair-Wakka Wakka man, was one of these Traditional Custodians. He was passionate about sharing the stories of the place and its associated landscapes using as many types of media as possible, including educational programmes run onsite. This relationship between custodial management of Gummingurru, and the archaeological representations generated about this site, has continued with the current onsite Custodian, Conrad Bauwens, and the Gummingurru Aboriginal Corporation generally.



Mapping Country in the Willandra Lakes Region World Heritage Area (WLRWHA)

Katherine Thomas, *La Trobe University*

Mal Ridges, *University of New England & Office of Environment & Heritage, NSW Government*

People routinely make maps but rarely think about the deeper meaning of them. Maps are being used to define the cultural landscape of Australia's Traditional Owners, but Country is more than just the distribution of stone artefacts and hearth sites. The values imbued on the cultural landscape should come from the Traditional Owners and not purely from computer modelling of the presence or absence of 'significant' data types. Our work in the Willandra Lakes utilises a participatory and collective approach to research designed to provide an alternative to current practices. This research exemplifies an approach that permits the inclusion of the voices of the Traditional Owners into representations and management of Country. In this paper, we describe research designed to reconstruct land use and occupancy zones on Country (Traditional Lands) into a GIS model by including oral testimonies. Using a variety of qualitative and quantitative mapping techniques, various spatial models of the pre-European landscape are presented. The complex, deeper geographical footprint of the archaeological record of the Willandra Lakes can only be uncovered through the use of a participatory GIS (*pGIS*) framework with the Paakantji, Ngyiampaa and Mutthi Mutthi communities in the WLRWHA.

Unveiling the Roman countryside – a combined methodology to map the structure and complexity of rural landscapes

Gijs Tol, *Classics & Archaeology, University of Melbourne*

Since the advent – and subsequent fast development – of archaeological surface survey as a major investigative technique from the 1950's onwards, tens of thousands of surface scatters have been identified. Although the amassed body of survey data has fundamentally transformed our understanding of Roman society, I argue here that survey archaeology has not yet tapped the full

potential of the surface and subsurface record and can still reach a much deeper understanding of the texture, complexity and development of Roman rural landscapes.

One of the principal reasons for this is that many landscape archaeological projects have adopted site-oriented approaches, resulting in simplified and static maps of dots that represent only sites – mainly those that involved the use of durable architecture and the consumption of pottery (habitation sites, religious areas, graves). Although since the 1980's off-site approaches that capture other types of activities, such as manuring and rubbish disposal, have gained ground, these approaches can only identify human activities that resulted in the deposition of material remains, especially ceramics. However, many activities may have taken place across the landscape that did not involve tangible material culture and are therefore also not captured by traditional surface survey techniques (ditches, field divisions, canals etc.), whereas features such as refuse pits might be too deeply buried and remain beyond the reach of the plough. In this paper, I present the results of a pilot study carried out in the Pontine Region (Lazio, Central Italy) that used an interdisciplinary off-site approach – incorporating surface survey, geophysical prospections and systematic coring – in an attempt to reconstruct the full range of activities and interventions associated with rural settlement and land use.

Gifting, barter and theft: tracking cross cultural exchanges in nineteenth century British New Guinea

Robin Torrence, *Australian Museum*

Ethnographic collections incorporate rich information about the myriad roles that objects have played in facilitating cross-cultural relationships within the Pacific region. During the early colonial period in British New Guinea, for example, exchange of indigenous items brokered a broad range of interactions between local groups and the diverse outsiders (e.g., explorers, miners, missionaries, government officials, constabulary and tourists) they sought out or were forced to deal with. An archaeologically informed study of a substantial ethnographic collection made by Sir William MacGregor (1888-1898) demonstrates the complex relationships among physical properties of artefacts (e.g., rarity of raw material, amount of decoration, used or freshly made, etc.), role in traditional society (e.g., domestic tool, trade

good, prestige item, ceremonial paraphernalia, etc.) and the social relations forged through their exchange. The large degree of flexibility and situational nature of the objects selected for cross-cultural exchange in 19th century British New Guinea, poses an intriguing challenge to the kinds of inferences about trade and exchange often used in prehistoric archaeology.

Cultural Induction and the use of kaitiakitanga

Edith Tuhimata, *Ngati Te Ata*
George Flavell, *Ngati Te Ata*

There are a number of mechanisms kaitiaki use to help shape and make informed decisions with regards to cultural heritage and development. The developers main goal is to develop their projects to enable them to make as much profit as they can. Their perception of that space is one of having a theme and trying to build their own story around this whether this is based on the actual story of the local Iwi about what happened in the past or the cultural heritage aspects sometimes this remains to be seen.

The developer gathers around them teams to get their development to completion - geotechs, archaeologists, surveyors, Consultants, construction companies etc compilation of their applications is the first goal. Speaking to the Iwi first is not always a priority. Many of our Iwi think of archaeologists as being a precursor to destroying or modifying a cultural heritage site. We know that time has taught us that our perceptions of the cultural heritage, our cultural landscape, our values and traditional resource management tools do not weigh up against the findings of an archaeological report in that respect.

If a developer wants to get their Project completed and they foresee difficulties they are prepared to go to environmental court to achieve that. Iwi do not have the monetary capacity the majority of the time or the expertise to argue the point so even if Iwi wanted to they only have limited success on that level.

As kaitiaki we help each other to try and achieve the best cultural, social, economical, environmental outcomes as we possibly can but this is difficult to achieve even in the best circumstances.

This is why on a kaitiaki level we now have a unique set of tools that enable us to have input into this process - we are constantly trying to educate, assess, inform and make the most informed decisions we can, our kaitiaki toolbox is pivotal in enabling us to practice kaitiakitanga in order to do that.

Palaeomagnetic dating of New Zealand archaeological sites

Gillian Turner, *School of Chemical and Physical Sciences, Victoria University of Wellington*
Bruce McFadgen, *School of Maori Studies, Victoria University of Wellington*

As the molten iron in Earth's outer core moves beneath us, the direction and strength of the geomagnetic field on the surface of the planet are constantly changing. The changes are recorded in the natural remanent magnetization of sequences of sediments that accumulate on lake-beds and the seafloor, and from these "master records" of the "palaeosecular variation" can be developed. NZPSV1k is a high-resolution, well-dated master record, applicable to the New Zealand region. It has been compiled from New Zealand lake sediment records and global models of direct geomagnetic observations,

Archaeological materials that have been heated to 700°C or higher also acquire magnetic records that are snap-shots of the ambient geomagnetic field at the time that they cool through the Curie temperatures of their constituent ferromagnetic minerals. If they remain in the position in which they cooled, then matching this thermoremanent magnetization record to a master palaeosecular variation curve provides an "archaeomagnetic" age for the artefact or material.

Over the past 6 years our work has focussed mainly on hangi stones, however we have also worked on samples of baked earth, bricks, and a stone-lined hearth. We have sampled over 20 archaeological sites. Some of these sites have been reliably dated by radiocarbon analyses on associated charcoal samples, some carry historical dates. In general the palaeomagnetic records of these sites agree extremely well with NZPSV1k. For many sites however, there is no associated datable material, or the only available charcoal carries a large inbuilt age, and here archaeomagnetic dating provides the only reliable age control. In other cases calibration of the conventional radiocarbon age results in ambiguous

calendar dates, and archaeomagnetic dating can refine the age control considerably. In this presentation the development of archaeomagnetic dating in New Zealand will be described and its future outlined.



The creation of a Strontium “isoscape” of Fiji and the Solomon Islands

Andrea Ulrichsen, *The Australian National University*

Strontium isotope ratios ($^{87}\text{Sr}/^{86}\text{Sr}$) have gained a considerable interest as a tool of geolocation with its usefulness stretching from ecology, forensic research and archaeology. Strontium isotopes act as a geochemical signature, and by analysing archaeological skeletal tissues (teeth and bone), and comparing it to a reference-set of bioavailable Sr in a region, it is possible to track prehistoric mobility. Strontium isotope studies in the Pacific have produced significant results in the research of ancient human mobility; however, several studies list the lack of available strontium baseline data as a major limitation. Establishing the ‘local’ bioavailable Sr isotope baseline of the geologically diverse islands in Fiji and the Solomon Islands is essential for ancient mobility studies in the islands.

In 2018, a large number of environmental samples were collected across the geological varied units in Fiji and the Solomon Islands to establish the first nation-wide high-resolution dataset of $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratios. The baseline information will be used in comparison to archaeological case-studies from the Solomon Islands, Fiji, and surrounding island groups. This will grant us the opportunity to explore human mobility within a skeletal assemblage and examine the potential effects of social status, gender, age and rank on past human movement.

O Ke Kahua Mamua, Mahope Ke Kukulu: building a strong foundation of Native Hawaiian cultural heritage stewards

Kelley Lehuakeaopuna Uyeoka, *Nohopapa Hawai'i and Huliauapa'a*

For over a century in Hawai'i, Native Hawaiians have fought to protect the integrity of our mo'olelo (stories and histories), wahi kūpuna (ancestral places), iwi

kūpuna (ancestral remains), koehana (artifacts and sacred items), and mo'omeheu (cultural practices) in the face of colonization and rampant land development in our island home. Arising from these conflicts have been emergent Hawaiian leaders that have utilized educational and technical cultural heritage management training as a platform to build a new generation of Native Hawaiian cultural heritage managers who are confident in both western science and indigenous knowledge. Nohopapa Hawai'i, a Hawaiian owned and operated cultural heritage management firm, and Huliauapa'a, a non-profit organization whose mission is to grow Hawai'i's communities through culturally based dimensions of innovative learning, leadership development and collaborative networking in wahi kūpuna stewardship, have partnered to create progressive educational programs utilizing holistic training models and multi-disciplinary curriculum. Our programs mentor and motivate Native Hawaiians to utilize their ancestral knowledge, connect with communities, obtain higher education degrees, and gain professional technical skills to become cultural heritage advocates in our communities. Through revitalizing our stories and histories, reclaiming our kuleana (rights/responsibilities) to our sacred spaces, and restoring our cultural sites and our connections to these places we are empowering our people and transforming the field of cultural heritage management for the well-being of our lāhui Hawai'i (Hawaiian Nation).

Creation of an Osteological Cetacean Reference Manual

Youri van den Hurk, *University College London*

The field of zooarchaeology is concerned with reconstructing human-animal interaction in the past. Cetacean remains are frequently encountered in archaeological contexts all over the world, including in Australia and New Zealand. However, these remains have frequently been neglected by zooarchaeologists for a long time. This can partly be ascribed to the fact that their remains are often extremely fragmented and there is a lack of high-quality osteological reference collections. These factors render identification to the species level problematic, resulting in a poor understanding of human-cetacean interaction in the past.

Recently however, new methods have shed more light on the history of cetacean exploitation, including aDNA

research and Zooarchaeology by Mass Spectrometry (ZooMS). For this study, however, a more traditional zooarchaeological method to analyse cetacean material was created: an osteological reference manual. Osteological manuals are an invaluable source to zooarchaeologists and are an aid in identifying zooarchaeological remains to the species level, however one for cetaceans does not exist yet. As part of my research I attempted to create an extensive cetacean reference manual at the Natural History Museum, Smithsonian, Washington DC, targeting 35 extant cetacean species. The creation of this manual in combination with the recent advancement in ZooMS analysis will hopefully optimise research on zooarchaeological (and palaeontological) cetacean remains and will lead to a better reconstruction of early cetacean exploitation.

Mackays to PekaPeka Expressway: Faunal remains from the monitoring phase

Yolanda Vogel, *Independent Researcher*

This paper presents the results of analysis from a large number of midden samples collected as part of archaeological monitoring of earthworks undertaken during construction of the Mackays to Peka Peka (M2PP) Expressway on the Kapiti Coast. A total of 91 faunal samples from 54 sites were analysed in order to gain an understanding of the range and diversity of subsistence practices within the project area. Much of the previous archaeological work on the Kapiti Coast has been undertaken within the context of residential development, with the results of faunal analyses generally showing a low diversity of species, particularly in the case of vertebrates. The large scale of the Mackays to Peka Peka Expressway project provided an opportunity to examine a much larger dataset of faunal remains from a number of sites over a wide geographic area, allowing for more robust interpretation and a fuller understanding of the factors affecting food procurement and environmental exploitation.

Contributions of archaeological research to indigenous tourism ventures: a case study from Maungaroa Valley, Rarotonga

Gareth Walter, *University of Auckland, Rio Tinto Australia*

Teuira Pirangi, *Highland Paradise*

Mahiriki Tangaroa, *Highland Paradise*

Vaine Wichman, *Te Toko Itu Rangatira Trust*

Maungaroa Valley holds a unique record of Rarotongan history. The possibility of this archaeological record contributing to economic development was first recognised in the late 1970's by Raymond Pirangi, a local entrepreneur, who cleared a tract of land and developed a cultural tourism attraction called Highland Paradise. The business was developed by his daughter, Teuira, in the early 2000's and currently consists of gardens with traditional economic, medicinal and ornamental plants, a number of traditional style buildings, the remains of a pre-contact marae, and other heritage assets. Efforts of the enterprise to showcase culture and heritage is recognised by five Air New Zealand Cultural Tourism Awards. Offerings include day tours, sunset feast and dance show, a cultural centre, and weddings. Highland Paradise also aims to promote heritage through an annual traditional skills competition for local children and efforts to establish a UNESCO recognised heritage reserve within the valley. Until recently, much of the heritage experiences offered to tourists and locals was limited to intangible cultural activities, reconstructions and the single marae structure. However, a partnership initiated by Highland Paradise and Te Toko Itu Rangitira Trust (traditional owners of the valley) with researchers from the University of Auckland has resulted in the development of a new tour through the archaeological remains of the valley. This paper explores the way in which archaeological research is balanced with Indigenous Knowledge to contribute to new products within an established Cultural/Heritage Tourism venture. Drawing on theory from both archaeology and tourism, the challenges and opportunities that such collaborations present are addressed. The issues include commodification of heritage, authenticity, cultural representation and respect, site preservation, accessibility, tourist expectations, custodian conditions, and engagement with national government and NGOs.



Archaeology and the Women's Christian Temperance Union

Clara Watson, *Underground Overground Archaeology*

The temperance movement was a social reform movement which sought to limit alcohol consumption, and ultimately prohibit its sale. The high levels of alcohol consumption which existed in early nineteenth century New Zealand were responsible for many social issues, leading to concerns surrounding its sale and calls for reforms. These calls for reform came from temperance societies, with the Women's Christian Temperance Union (WCTU) being one of the leading societies from the period. This paper presents results from a recent MA thesis on the archaeology of the temperance movement. Alcohol bottles were used as a proxy for temperate behaviour, with the initial hypothesis being that alcohol bottle numbers would have decreased during periods of temperance activity, and that given the scale of the movement, this decrease should be seen in a random sample of household assemblages. This research found that evidence for the temperance movement could be seen in the archaeological record, with one interesting result being that the impact of the WCTU on drinking in the household could be seen through the archaeology. This paper will discuss the impact of the WCTU on the temperance movement, and how the archaeological record tells a different story to that of the historical record.



Women breaking the rules

Katharine Watson, *University of Canterbury*

Maria Lillo Bernabeu, *Underground Overground Archaeology*

A pharmacist, a dressmaker, a caterer, a prohibitionist, a petty criminal and a timber and coal merchant – six women who lived in 19th and early 20th century Christchurch. Some of these women actively chose to break the rules for women during that period, to push the boundaries of what was normal and acceptable for the ideal Victorian woman. Others were forced to push the boundaries by their economic circumstances, particularly through the death of a husband. Even though these women broke

the rules on one level, the trajectories their lives took were still circumscribed to a certain extent by societal norms. These six women – Caroline, Elizabeth Robinson and Elizabeth Smith, Fanny, Mary and Sarah – were the focus of an exhibition we prepared for Christchurch's Beca Heritage Week (and still available on Instagram), chosen because some aspect of their life was revealed to us through archaeology, but their stories are more common than they might initially seem. This paper looks at the lives and occupations of these six women, what archaeology and history tells us about them, their visibility in both records and how these women made their way in society.



The identification and recovery of backing debitage: a new method for detecting backed artefact industries

Amy Mosig Way, *The University of Sydney*

Amy Tabrett, *The University of Sydney*

This paper presents a new method for the detection of backed artefact industries through the identification of backing debitage. The waste flakes produced during backing retouch are found to have a combination of unique attributes that distinguish them from other small retouch and core reduction flakes. Experimentally produced flakes are compared with an assemblage from a mid-late Holocene site in southeastern Australia, which contains multiple backed artefact production events, including a waste-flake-to-backed-artefact refit. It is shown that the waste flakes in the experimental work hold the same diagnostically distinct attributes as the flakes seen in the archaeological assemblage. This provides compelling evidence for the ability to classify backed artefact waste flakes and identify backed artefact production events in the absence of the finished artefact. The small size of the backing debitage and the implications this has for screen size selection are also discussed.



New simulation tools for the design and assessment of subsurface testing programs: Dig It Design It and Dig It Check It

Amy Mosig Way, *The University of Sydney*

Amy Tabrett, *The University of Sydney*

There is a general awareness among archaeologists that the intensity of a sampling program, i.e. the number of pits, their size and their spacing, has a strong bearing on discovery rates. However, rarely is the effect of this relationship explicitly assessed due to the difficulty of running the required mathematical models. This poster presents two simulation models: Dig It Design It and Dig It Check It which allow the archaeologist to easily design and assess subsurface testing programs using statistical modelling. Both models are available online, are very easy to use, and no mathematical knowledge is required to run them. These models have the potential to dramatically increase the use of statistically defensible sampling programs within the archaeological community, to improve site discovery rates, and to improve interpretations based on subsurface sampling by revealing the capabilities and limitations inherent in any subsurface sampling strategy.



A Consideration of the Secret Sacred Room, Queensland Museum, as a Contemporary Cultural Landscape

Anna Weisse, *School of Social Science, The University of Queensland*

Leonie Coghill, *Manager Repatriation and Community Engagement, Queensland Museum*

The conceptualisation and interpretation of cultural landscapes intentionally avoid narrow definitions to accommodate the diverse and varied ways in which people interact with, and move through, the natural landscape in the past and present.

Framed within ideas of designed and associative landscapes as outlined in *Understanding Cultural Landscapes* (Australia ICOMOS 2010:1) this presentation

explores the evolution of the Secret Sacred room located in the Queensland Museum, Brisbane, as a contemporary landscape of cultural, and indeed spiritual, significance. The Secret Sacred room, which houses hundreds of ancestral remains of Australian Aboriginal and Torres Strait Islander people, has been purposefully arranged to satisfy cultural, symbolic and spiritual requirements and acts to entwine past and present communities in a unique form of contemporary landscape.

Reference

Australian ICOMOS (2010). *Understanding Cultural Landscapes*. Online at <https://australia.icomos.org/wp-content/uploads/Understanding-Cultural-Landscapes-Flyer-5.1-Low-Res.pdf>.

Towards inclusivity in archaeological research and practice: An academic perspective

Daryl Wesley, *Flinders University*

With the establishment of the National Disability Insurance Scheme in Australia in recent year, inclusivity and supporting people with disability has been in the national spotlight. It has resulted in reflection through all sectors of society the extent of marginalisation that still exists when considering people with differing abilities. It has become apparent that in existing research grant systems there are limited mechanisms to pursue developing inclusivity in archaeological research projects. Supporting students and staff with disability requires extra resources and funding if they are to be involved in archaeological research. An uncomfortable tension exists between grant funding bodies, government assistance programs, and institutions about allocation of resources and funding who is ultimately responsible for providing costly supports beyond ergonomic office solutions. This session brings together a range of views and experiences to begin an important conversation on developing the appropriate recognition and support systems that provides ongoing opportunity for all to experience and participate in archaeological research.

Nāia te toa a Tarewai! Taking control of the past

Rachel Wesley, *Otago Museum, Te Rūnanga o Ōtākou*

The hapū of Kāti Taoka and Kāi Te Pahi, based at Ōtākou on the Otago Peninsula, have never completely forgotten the internecine strife that characterised the battles between their tūpuna for mana and supremacy in the Otago area. Collective memories of sieges, alliances, utu, and politicking have been at the foundations of hapū identity for generations.

In recent years, taoka have become uncovered within the Ōtākou takiwā, including a partial waka hull from Papanui Inlet in 2014, and more recently a wooden weapon on the Taieri River. The exposure of such taoka at sites of immense historical significance has co-incided with a renaissance of cultural identity and exploration of traditional mātauraka amongst Ōtākou rakatahi. The involvement of rakatahi and other hapū members in the excavations and monitoring at Papanui Inlet is contributing towards a strengthened engagement with the past; and the deeper understandings of traditional mātauraka is forging an increasing interest in taking control of the excavation and interpretation of manawhenua history in the takiwā, Papanui Inlet in particular.

In an attempt to answer the question 'Is there a Māori archaeology?', this paper will share the Ōtākou journey so far, and explore to what extent rakatirataka can be asserted within current legislation and archaeological practice in New Zealand.

Investigating settlement patterns and questions of mobility in Mithaka country, on the eastern edge of Australia's arid centre

Michael C. Westaway, *Griffith University*

Shaun Adams, *Griffith University*

Douglas Williams, *Griffith University*

Kelsey Lowe, *University of Queensland*

Justyna Miskiewicz, *Australian National University*

Betty Gorringe, *Mithaka Aboriginal Corporation*

Max Gorringe, *Mithaka Aboriginal Corporation*

Reconstructing mobility patterns is critical to understanding the nature of hunter-gatherer systems and indeed how they may have changed over time. In this context, the development of increased sedentism in foragers is often interpreted as an indicator of increasing socio-economic complexity. Our understanding of pre-contact Aboriginal mobility patterns is quite limited, and has largely been influenced by ethnohistory and the study of the distribution of exotic raw materials from trade and exchange systems. Sedentism has been reconstructed also by reference to ethnography, and also through the emergence/presence of new sites types, e.g. earth mounds, stone fish traps and weirs, domestic structures, cemetery sites etc. Survey and remote sensing undertaken by Griffith University and the Mithaka Aboriginal Corporation over the past two years has documented an extensive network of site complexes associated with the desert channels within Mithaka country. Combined with the available ethnography, they indicate a degree of sedentism. We have commenced reconstructing mobility patterns through a study of the ancestors of the Mithaka people by employing Sr isotopes, and here present our initial bioarchaeological results highlighting the importance of this approach for reconstructing patterns of mobility and sedentism.

Encountering stone tools

Peter White, *University of Sydney*

In 1964 in the eastern Highlands of Papua New Guinea I worked with men who had grown up in a society that made and used stone tools. Their flake tools had no formal patterning! This challenged my Cambridge training: how could we use these tools to research the archaeology of Sahul? My first attempt didn't get anywhere much, but facing assemblages of unretouched tools has led Pacific and Australian analysts into realms of sourcing, technology, use wear and residue analysis.

Tweetable summary: I thought I had learned all about stone tools at Cambridge, but Papua New Guineans taught me differently.



Potential Applications for 3D modelling and game engine development environments in the HBIM process and the cultural heritage industry

Andrew Wilkinson, *Flinders University*

Ildike Piercy, *Jacobs Group (Aust)*

Ben Watson, *Jacobs Group*

This paper investigates the effectiveness of photogrammetry and 3D modelling applied in popular game engine integrated development environments (IDE) to ascertain its suitability for incorporation into the historic building information modelling (HBIM) framework. The HBIM process allows for greater collaboration and integrated management across multiple disciplines operating within the architectural, engineering, construction and operation (AECO) industries, yet it has not been widely used as a tool for data collection, analysis and management in the cultural heritage industry. The primary objective is therefore to understand the pros and cons of the methodology and its effectiveness in relation to required data input for the HBIM process with a view to understanding its potential application for commercial projects. Specifically, it considers its application within the context of the Australian cultural heritage industry, which is largely driven by building development and infrastructure programs in which spatial data are extensively used. IDE software was chosen as a readily available real-time development platform which has the ability to enable total control of the rendering process to achieve a high level of detail and visual fidelity along with real-time rendering of models.



A Satellite Imagery/GIS Survey for Aboriginal Archaeological places in Channel Country, SW Queensland.

Doug Williams, *Griffith University*

Kelsey Lowe, *University of Queensland*

Michael Westaway, *Griffith University*

Betty Gorringer, *Mithaka Aboriginal Corporation*

Max Gorringer, *Mithaka Aboriginal Corporation*

Internationally, archaeological surveys using a combination of satellite imagery and remote sensing techniques are commonly applied in areas where earthworks or monumental architecture are part of the archaeological record. The results of studies that have used a variety of remote techniques to effectively examine areas that are inaccessible through field survey, or invisible at ground level continue to produce results that would otherwise not be easily acquired. Australia is not generally seen as a continent where Aboriginal cultural practices have modified landscapes to an extent that they are visible using standard, publically available features. This paper reports on the initial results of a survey for particular Aboriginal places in the Channel Country of far South West Queensland which could not have been achieved without recourse to satellite imagery, geophysical techniques and GIS, the results of which challenge perspectives of the scale of Aboriginal trade, economy and settlement patterns in the region.



Connecting with spirits from the land: Indigenous cultural protocols in consulting

Jasmine Willika, *Flinders University*

Antoinette Hennessy, *Blackwood Heritage Consulting*

This is a presentation about the experience of being an Australian Indigenous consultant working on other Indigenous people's traditional lands in Australia. It draws on the experience of Jasmine Willika, a young Jawoyn woman from the Northern Territory, who is studying archaeology at Flinders University and is considering archaeological consulting and heritage management as a career pathway. As a student volunteer on a consulting project, Jasmine found herself guided by her culture and traditions to engage with Traditional Owners and their Country outside of her own group, but was unsure if it was appropriate for her to initiate her cultural views. This is an example of how tension may arise in the course of practice as a result of Indigenous archaeology undergraduate students sensing the need to express cultural protocols before, during and after archaeological surveys. This paper seeks to encourage discussion about

this important issue by reflecting on the process of decolonisation in the discipline. This presentation also considers the sorts of cultural protocols that Indigenous Australians (and other Indigenous peoples) prefer as a sign of decolonising practice. In addition to observing national and international codes of ethics in consulting, Aboriginal people may feel the need to fulfil their own cultural obligations among their own countrymen or other Indigenous peoples. For example, in some parts of Australia, Indigenous ethical practices like ‘singing out’ to Country is recognised as a cultural obligation that must be done before work can commence. These practices are a core part of living Aboriginal identity as part of a continuing practice of communication and exchange between Aboriginal groups, and with ancestors. Such protocols are built on a foundation of respect and cultural responsibility – but will they be taken seriously by other practitioners? We ask: what does equality of partnership between non-Indigenous archaeologists and Indigenous Australians in consultancy (and research) look like?



A Tale of Two Managed Landscapes: Using Anthracology to Compare Māori Plant Management between Coastal and Inland Plant Production Sites

Nikole Wills, *University of Otago*

Ian Barber, *University of Otago*

Recent research highlights the importance of the management of both domestic and wild plants by the first Polynesian settlers of New Zealand. In this paper, we apply an anthracological approach to investigate vegetation management in coastal and inland North Island agricultural landscapes by early Māori. In so doing, it is our intention to elucidate human-plant relationships across the diverse landscapes of early Māori plant production. The coastal landscape we consider is Cooks Beach (Pukaki), Coromandel Peninsula. In this area which is known for specialist obsidian extraction, evidence of kūmara (*Ipomoea batatas*) gardening is recorded in a dune system. The inland site is Horotiu, Waikato, where we interpret soil and archaeological evidence to identify a multi-cropping complex on a lower river terrace. We interpret plant charcoal analyses from both localities to investigate patterns of land clearance, management and plant resource use between coastal dune and

inland alluvial environments. Anthracological data is used to explore how Māori of both environments utilized vegetation resources in the course of plant production activities. This comparative analysis highlights the importance of anthracology to elucidate the settings and processes of vegetation exploitation in Māori plant production.

New collaborations of whaling and Ngarrindjeri whale enchanting from Encounter Bay, South Australia

Dr Christopher Wilson, *Flinders University*

Dr Adam Paterson, *SA Maritime Museum, Flinders University*

Some of the earliest interactions between Australia’s Indigenous people and newcomers occurred at whalers and sealers camps. A pattern of settlement developed, associated with the related industries of whaling and sealing, that was littoral, often transitory, populated by creole communities and situated at the colonial margins (Russell 2012). This paper builds upon previous research within Australian archaeology and pacific studies to investigate new questions of how Indigenous peoples and whalers contributed to local whaling economies during the early colonisation of South Australia. For Ngarrindjeri people these histories of contact are significant for developing a deep understanding of the records created by governments, missionaries and explorers that have documented the colonial narrative since occupation of Ngarrindjeri lands. Ngarrindjeri voice within these records has been absent from histories of the South Australian whaling industry. This paper discusses new collaborations between Flinders University and the SA Maritime Museum investigating shore whaling at Encounter Bay (1837-c1860) and especially the agency of Ngarrindjeri whalers and connections to Kondoli (whales). Further, we hope the recent discovery of the barque *South Australian*, will assist in expanding the way that collaborators approach the archaeology of early maritime/colonial encounters and the broader landscape/seascape of the whaling industry in South Australia.

Beyond facts, figures and tables: excavating the reality of archaeological practice through the written page

Kelly D. Wiltshire

The written page is a place all archaeologists encounter, whether it be in the form of our field notes, a site report or an academic publication. This presentation describes my encounters with the written page and argues this place – located beyond the boundaries of an archaeological site – is where archaeological knowledges become entangled and are ultimately produced. By reflecting upon the written page, this presentation seeks to make visible the people – both past and present – this place obscures, which in turn obscures the reality of archaeological practice.

‘Eureka! - We Have Found It!’ (or at least we think we have ...)

David Wilton, *Coromandel Heritage Trust*

Richard Wilkins, *University of Waikato*

Neville Ritchie, *Department of Conservation*

The project commenced with a (successful) search for the miner’s cottage of Eureka claim co-owner Richard Ross, built c.1870 in the Kuranui Valley, east of Thames. Over about 18 months, this expanded into a series of above-ground searches in the Moanataiari - Kuranui area. It soon became apparent that this was the location of the gold mining settlement known as *Eureka* (named after the Eureka claim) and that it was a significant archaeological landscape. For example, at least 12 probable building sites were located and recorded, including the residence of another early Thames goldfield family - that of miner William Lang. Significant mining features, and a possible site of the Eureka School were located. There are indications that over a hundred people resided at the settlement, and the names of at least 35 separate families have been obtained from historical records.

There has been public involvement in the project from the outset. The trigger was a query from a member of the public (a descendant of Richard Ross). The project was materially assisted by the local Mountain Bike Club, who have cleared an extensive network of tracks in the area. Historical research was assisted by descendants of residents of the settlement. Strong public interest

was also demonstrated by a talk and guided walk to the settlement in October 2017, with three generations of descendants of one Eureka family attending.

A limited below-ground investigation is in planning for Archaeology Week 2019, which will involve public observation, and, hopefully, active participation. A self-guided, interpreted walk to Eureka, incorporating other mining sites nearby, is also under consideration.

Bipolar stone technology and early Polynesian innovation in New Zealand

Dan Witter, *Witter Archaeology*

Extreme reduction techniques used to manufacture tools of obsidian and other fine-grained materials have been identified for two assemblages from a stratified site at Redcliffs. As a result of the Canterbury Earthquakes, repairs to a pump station at the front of Moncks Cave was monitored by Jeremy Habberfield-Short in 2015. The site produced midden shell and bird bone (including moa) as well as artefacts of bone and stone. The production of small flakes with razor like edges was a prominent component. Lithic attribute and use wear analyses indicate that the supply of obsidian and other fine-grained stone needed for this was limited. To maximise this material, the bipolar technique was used for the continued reduction of expended cores as well as recycling other small flake tools as cores. These small flakes with usewear are interpreted as important for fibre and textile production which was essential for an adaptation to temperate conditions. The bipolar technology was likely to have been a women’s innovation.



Plastics in Archaeology (PIA): Initial investigations into Australian archaeological collections using ATR-FTIR and FTIR reflectance

Sharon Wong, *Grimwade Centre for Cultural
Materials Conservation, University of Melbourne*

Petronella Nel, *Grimwade Centre for Cultural
Materials Conservation, University of Melbourne*

Clare Kim, *Grimwade Centre for Cultural Materials
Conservation, University of Melbourne*

Current research problems include: (1) A limited knowledge of the types and deterioration of excavated plastics; (2) The ageing and failing of archaeological interventive materials such as adhesives, coatings, labels or consolidants that have been used to repair artefacts; (3) Deterioration phenomena exhibited by polyethylene storage bags; and (4) Minimal archaeological plastics conservation expertise. Using polymeric artefacts excavated from Australian archaeological sites, the findings from PIA are important as they should increase knowledge of plastic archaeological artefacts and contribute to the conservation strategies to actively manage malignant plastics in museum collections so as to preserve Australian archaeological heritage.

The paper will focus on one aspect of PIA, which is the use of FTIR as a non-invasive scientific technique to analyse excavated plastics. It is vital to identify archaeological plastic artefacts in order to store them correctly. Plastics identified may also reveal what types of plastics are likely to survive in a burial environment. Preliminary investigations have found it challenging to identify plastic artefacts obtained from archaeological dig sites using ATR-FTIR, which requires contact with the artefact being measured. Subsequent investigations used a new identification method, FTIR reflectance, which does not require contact with the artefact being measured, thus being truly non-invasive. The early stages of the research seeks to identify these archaeological plastic artefacts in a conservation laboratory using new analytical equipment and to explain why the ATR-FTIR method does not work well for certain plastics.

The data from the research will be uploaded and maintained in the PolyMuse Online Heritage Resource Manager database to promote collaboration and data sharing between institutions. The procedures and results from the initial investigations will also contribute to the overall FTIR methodology for the Australian Research Council's Linkage Project to promote replicability for future analysis of plastic archaeological artefacts.

This research is supported fully by the Australian Government through the Australian Research Council's Linkage Projects funding scheme (project LP160100160) and by a McCoy Project PhD Scholarship.

Mary Byrne: a life in teapots

Naomi Woods, *New Zealand Heritage Properties*

Tea ware has been the focus of numerous North American and Australian historical archaeology studies of female consumer behaviour in colonial contexts. This paper uses data from a nineteenth century urban site in Whanganui, New Zealand, to examine how these previously explored experiences of self-expression and social pressure compare to those of a woman from another part of the colonial world. To do this, the ways in which three aspects of Mary Byrne's tea ware assemblage changed over time were examined and considered alongside events which occurred during her 40-year occupation of the site. The results highlight the varied and complex ways in which a first-generation settler in New Zealand used material culture to negotiate a place in her new community.

Rocky shores, mud, and mangroves: An assessment of Holocene economic intensification at the Yindayin (Endaen) rockshelter, Stanley Island

Martin Wright, *University of Sydney*

Patrick Faulkner, *University of Sydney*

Clarence Flinders, *Flinders and Howick Islands*

Aboriginal Corporation

Michael Westaway, *Griffith University*

Economic intensification is a prominent concept in the global hunter-gatherer literature, being used to explain increasing hunter-gatherer complexity and the transition to domestication and permanent settlement. This paper uses invertebrate material recovered from Yindayin (Endaen) rockshelter on Stanley Island (North Queensland) to evaluate whether population driven economic intensification occurred in this area during the Holocene. Environmental and climatic data has also been used to evaluate their effect on the observed subsistence patterns. An explanatory model describing occupation at Yindayin has been produced that incorporates the results of the economic intensification assessment, environmental and climatic data, and data from Beaton's original analysis of sites within Princess Charlotte Bay.

This study did not find a unidirectional increase in occupation during the Holocene. Instead, the results demonstrated that subsistence and occupation patterns

at the site were complex and non-linear, with periods of increased occupational intensity interspersed with periods of stability and abandonment. Environmental and climate change had the most visible effect on subsistence behaviours, while the potential for population induced economic intensification was only identified within the sequence corresponding with the last 200 years of occupation.

These results emphasise that interactions between people, environment, and climate are complex, and that to presume there are singular explanations for variation in coastal occupation and subsistence potentially skews interpretations of past human foraging behaviour. This study demonstrates how economic intensification can be deduced from archaeological correlates and how population driven effects may be separated from environmental effects under certain circumstances. Finally, this study demonstrates the value of invertebrate assemblages for interpreting the responses of coastal foragers to environmental and population driven resource pressure.

Post-Lapita exchange networks of Sio and Type X pottery in the northeast New Guinea-Vitiaz Strait-New Britain region

Peihua Wu, *Department of Anthropology and Archaeology, University of Otago*

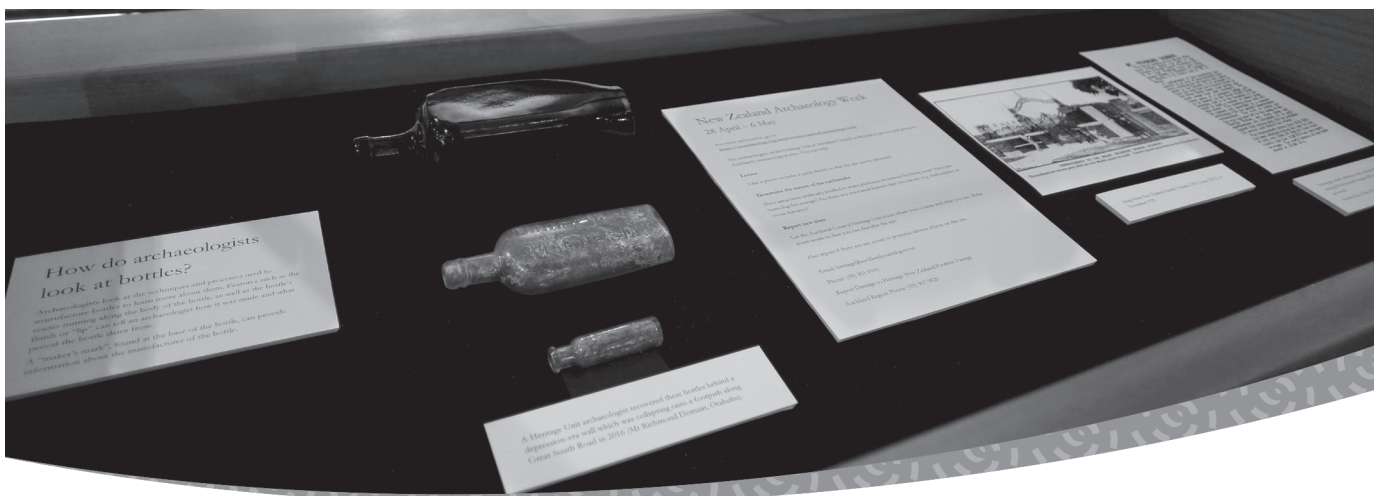
This paper presents the latest identification of Sio and Type X pottery found in the Arawe Islands of Papua New Guinea, and investigates Post-Lapita exchange networks of these two pottery styles in the northeast New Guinea-Vitiaz Strait-New Britain region. During Lapita time most pottery was produced locally at each Lapita site, while a few pots were exchanged between the Lapita communities over a large region, such as those exchanged between the entire Bismarck Archipelago or even further afield. However, in the Post-Lapita period smaller regionalised exchange networks were developed when pottery was produced in specific production centres and distributed in the region, while sites in the region ceased to make pottery. The connection between Lapita and Post-Lapita pottery and the development of Post-Lapita exchange networks need further investigations to clarify.



New technologies for old: using 3D models to identify change in Indigenous Australian lithic reduction strategies

Simon Wyatt-Spratt, *University of Sydney*

3D modelling is an increasingly important component of the lithic analyst's toolkit. While there have been several pioneering studies by archaeologists connected to Australia describing how this technology can be applied to understanding lithic reduction sequences there have been no major published studies of this sort on Indigenous Australian stone artefact assemblages. This paper will present preliminary results and interpretations of analysis of scanned cores from a series of rockshelter sites dated to the Holocene done as part of the ARC project *Traditions, Transformations and Technologies*.



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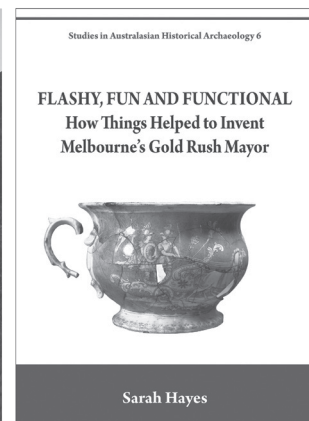
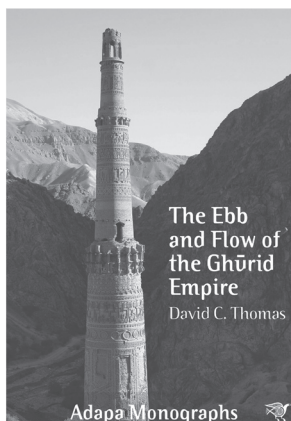
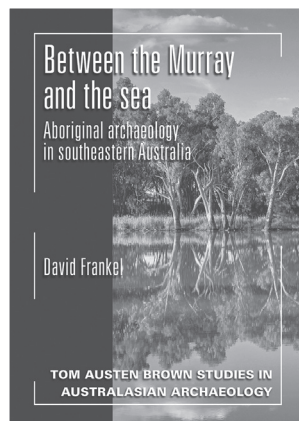
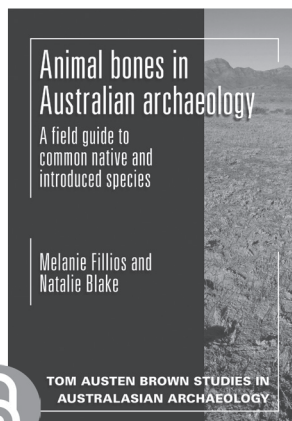
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