Old Guard, New Guard: Program and Book of Abstracts of the Australian Archaeological Association Annual Conference 2009

11-14 December 2009
Flinders University
Adelaide, South Australia

Flinders
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Acknowledgements

The Conference Organising Committee would like to offer a gracious thank you to all of our generous conference sponsors, without whom the conference would not have been possible:

- Australian Cultural Heritage Management
- Aboriginal Heritage Branch, Aboriginal Affairs and Reconciliation Division, State Government of South Australia
- Electranet
- Comber Consulting
- Waikato Radiocarbon Dating Laboratory
- GNS Science
- Godden Mackay Logan
- Biosis Research Pty Ltd
- South Australian Museum
- Australian Association of Consulting Archaeologists Inc.
- Yunggorendi First Nations Centre For Higher Education and Research
- Jo McDonald Cultural Heritage Management
- Archaeological and Heritage Management Solutions Pty Ltd
- World Archaeological Congress
- The Australian National University
- Flinders University Art Museum
- Society of Antiquaries of London

Thank you also to the Australian Archaeological Association, Australian Association of Consulting Archaeologists Inc. and Eureka Archaeological Research and Consulting for sponsoring prizes at this year's conference.

Also thanks to the Department of Archaeology, School of Humanities and EHLT Faculty at Flinders University for support and the use of facilities. A special thanks to administrative and general staff at Flinders University for their assistance throughout the months leading up to the conference, particularly:

- Katherine Sutcliffe
- Graham Tulloch
- Judy Kuckhahn
- Lynn Vanzo
- Jenny Ayliffe
- George Filipov
- Vincent Ciccarello

Former Archaeology student Lucinda Bragg generously gave up her holiday time to take up a position as IT Co-ordinator, thus helping keep technical glitches to a minimum and earning our everlasting gratitude. To Susan Chirgwin, who provided assistance to the Organising Committee as part of a cultural heritage management practicum involving organising the Photography Competition and Wine Tasting, our gracious thanks–everyone at the conference appreciates your efforts. And to Richard Venus who designed the photography posters (and many other flyers and other things along the way)– we are in awe of your graphic design skills and hope to continue to exploit you mercilessly (with wine by way of partial recompense) in the future!

Our keynote speaker Geoff Bailey travelled from the University of York to be with us, along with Special Guests Patty Jo Watson and Bill Lipe who travelled from the USA, and we extend a warm thanks to all of you for your efforts.

We extend a special thanks to the Session Convenors for their efforts to ensure the conference ran smoothly and that we had an interesting range of papers: Karen Alexander, Mick Broderick, Dawn Cropper, Judith Field, Jillian Garvey, Dee Gorring, Alice Gorman, Neale Draper, Steve Hemming, Boone Law, Kelsey Lowe, Ian Moffat, Mick Morrison, Annie Ross, Illya Santos, Claire Smith, Stafford Smith, Nikki Stern, Fiona Sutherland, Jacqui Tumney, Peter Veth, Victoria Wade, Lynley Wallis, Chris Wilson, Kelly Wiltshire and Duncan Wright.

Members of the Australian Archaeological Association Executive Committee provided support and advice throughout the year, as did Patrick Faulkner and Sean Ulm.

Thank you to Fiona Salmon and her dedicated staff at the Flinders University Art Museum, Anthony Murphy and artists from Injalak Arts and Crafts, and Emeritus Professor Vincent Megaw for their outstanding efforts in organising the *Art from Injalak Exhibition*.

For help with organising post-conference tours we would like to thank Keryn Walshe of the South Australian Museum, Kristy Cutts of Groovy Grape Marketing, Steve Fowler of Wine Lovers Tours, Alfie of Alfie's Wine Tours, and Denise Manson of the Adelaide Hills Wine Region.

Finally, to the many student volunteers from the Department of Archaeology at Flinders University who went above and beyond the call of duty to carry out a multitude of tasks both large and small, thus ensuring the conference went as smoothly as possible for everyone, we are all extremely grateful!

Diamond Sponsorship

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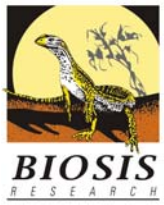

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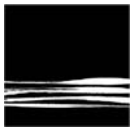

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Introduction

Welcome to the Australian Archaeological Association Annual Conference 2009, “Old Guard New Guard”. The last decade has seen major changes in the environment of Australian archaeology. The mining boom has created new job markets, with new requirements for education and training in archaeology. In several states, new heritage legislation has been introduced, and more heritage Acts are currently under review. Australian archaeology and archaeologists have gained a wider global audience in the wake of controversies such as those over the Flores hominids and rock art management on the Burrup Peninsula, and global issues such as climate change have permeated academic and public discourses about the past. At the same time, academic baby boomers have been approaching retirement, leading to predictions of a shortfall of experienced people in the tertiary education sector, as well as a general change in the complexion of professional archaeology. In the 2009 AAA Conference "Old Guard, New Guard", we ask participants to consider what will be the major directions for archaeology as we head into the second decade of the 21st century. How will new generations of archaeologists build on - or deconstruct - the research and practice of the past 50 years?

General Information

Conference Organising Committee

Name	Affiliation	Role
Alice Gorman	Dept of Archaeology, Flinders University	Conference Chair
Lynley Wallis	Aboriginal Environments Research Centre, University of Queensland	Program Chair
Louise Holt	Dept of Archaeology, Flinders University	Poster Session Co-Convenor
Toni Massey	Dept of Archaeology, Flinders University	Poster Session Co-Convenor
Chris Wilson	Dept of Archaeology, Flinders University	Indigenous Liaison Officer
Judy Kuckhahn	School of Humanities	Finance Officer
Dave Mott	Australian Cultural Heritage Management	Sponsorship Officer
Susan Chirgwin	Dept of Archaeology, Flinders University	AAA Photography Competition Convenor
Peter Birt	Aboriginal Heritage Branch, Aboriginal Affairs and Reconciliation Division, State Government of SA	AARD Representative
Kelly Michael	Dept of Archaeology, Flinders University	Student Representative
Katherine Sutcliffe	School of Humanities	Administration Officer
Jenny Ayliffe	School of Humanities	Administration Officer
Lynn Vanzo	School of Humanities	Administration Officer
Claire Smith	Dept of Archaeology, Flinders University	General Representative
Heather Burke	Dept of Archaeology, Flinders University	Volunteer Coordinator
Donald Pate	Dept of Archaeology, Flinders University	Exhibitor Coordinator
Duncan Wright	Centre for Australian Indigenous Studies, Monash University	Media Liaison Officer
Lucinda Bragg	Dept of Archaeology, Flinders University	IT Co-ordinator
Debra Robertson	Dept of Archaeology, Flinders University	General Representative

Papers

If you are presenting a paper, please let your Session Convenor know that you have arrived as soon as possible after registering–your Session Convenor will advise you if there are any last minute changes to your session. If you have any special requirements for you presentation, please advise the IT Coordinator Lucinda Bragg at registration.

Please also see Lucinda the day before the session in which your paper will be presented to arrange the loading of your data projection file (eg Microsoft Powerpoint) onto the central conference computer. Presenters WILL NOT be able to use personal computers for data projection purposes. Please note, there are NO facilities for overhead projection in the main Matthew Flinders Lecture Theatre.

Please ensure that your powerpoint presentation is saved as a 2003 format (rather than VISTA/ 2007) to minimise glitches when uploading.

Posters

Please notify the Poster Co-convenor Louise Holt at registration if you have a poster that needs to be displayed – Louise (or a volunteer assistant) will be available in the registration room all afternoon Thursday, and Friday morning.

Posters will be mounted on the display boards in the poster room as soon as possible after their delivery by the Poster Co-convenor. All posters will be eligible for judging by a panel of referees in the formal Poster Session on Friday evening (see below). If you have a STUDENT poster (ie a poster solely authored by students) make sure that Louise Holt is made aware of this so she can mark it appropriately so it will be eligible for the Student Poster Prize. Poster presenters should organise to remove their poster during the Monday lunch period. Poster prizes will be awarded at the Conference Dinner on the evening of Monday 14 December. If you have any further questions about this please contact Louise Holt (Louise.Holt@flinders.edu.au).

Conference Prizes

Prizes Sponsored by the Australian Archaeological Association Inc.

- The Australian Archaeological Association Annual Conference Best Overall Paper Prize $500
- The Australian Archaeological Association Annual Conference Best Student Paper Prize $500

Note: If the Best Overall Paper Prize is a student, the Best Student Paper Prize will be awarded to the second place student paper.

Prizes Sponsored by the AAA2009 Conference Organising Committee

- The Australian Archaeological Association Annual Conference Best Overall Poster Prize $500
- The Australian Archaeological Association Annual Conference Best Overall Student Poster Prize $500
- The Australian Archaeological Association Annual Conference Runner-Up Student Poster Prize $250
- The Australian Archaeological Association Annual Conference Photography Competition Best Archaeological Site Image Prize $200
- The Australian Archaeological Association Annual Conference Photography Competition Runner-Up Best Archaeological Site Image Prize $100
- The Australian Archaeological Association Annual Conference Photography Competition Best Archaeological Fieldwork or Labwork Prize $200
- The Australian Archaeological Association Annual Conference Photography Competition Runner-Up Best Archaeological Fieldwork or Labwork Prize $100
- The Australian Archaeological Association Annual Conference Photography Competition Best Archaeological Artefact Image Prize $200
- The Australian Archaeological Association Annual Conference Photography Competition Runner-Up Best Archaeological Artefact Image Prize $100
- The Australian Archaeological Association Annual Conference Photography Competition Best Artistic Image Prize $200
- The Australian Archaeological Association Annual Conference Photography Competition Runner-Up Best Artistic Image Prize $100
- The Australian Archaeological Association Annual Conference Photography Competition Best Lighter Side of Archaeology Prize 6 bottles of Flinders University departmental wine

Note: If the Best Overall Poster Prize is a student, the Best Student Poster Prize will be awarded to the second place student poster and the third place will move up the order.

Prizes Sponsored by the Australian Association of Consulting Archaeologists Inc.

- The Laila Haglund AACAI Prize for Consulting Archaeology $500

  The Australian Association of Consulting Archaeologists Incorporated is the major body for the accreditation and promotion of consultants who work in the allied sub-disciplines of Indigenous, historic, industrial and maritime archaeology throughout Australia. It actively seeks to maintain and further develop high standards of consultancy performance. Towards this end it has contributed a prize of $500 for the best contribution on consultancy archaeology to the Australian Archaeological Association Annual Conference.

Prizes Sponsored by Eureka Archaeological Research and Consulting

- The Eureka Archaeological Research and Consulting Prize for Excellence in Archaeological Interpretation $500

  The paper will demonstrate how scholars - academics, students, consultants, vocational archaeologists - have addressed defined research problems in appropriate ways. It will describe the outcomes of that research and the interpretation of the results for our understanding of the past. Papers will describe answers to particular research questions, the testing of specific hypotheses, and demonstrate substantive research. Papers fulfilling these criteria arising from consultancy work will be particularly welcome. This does not include papers that solve heritage/management problems, nor ones that describe new methodologies for their own sake. Presentations might, however, describe how a consultancy has shed new light on a particular research issue, or how a new technique has produced an outcome to a specific research question. Judges will include senior academic, consultant and management archaeologists with a specialisation in Indigenous, historical and/or maritime archaeology as appropriate.

AAA Annual General Meeting

The AAA AGM will be held on Friday evening (11 December 2009) from 5.30-7.30 pm in North Lecture Theatre 3 (off the Humanities Courtyard). If you have any items for the agenda please see Ian McNiven (President) or Tim Denham (Secretary). All are welcome to attend, but only financial members can vote. If you have not paid your AAA membership for 2009 please see Jeremy Ash (Membership Secretary).

AACAI Annual General Meeting

The AACAI AGM will be held on Saturday evening (12 December 2009) from 5.30-7.30 pm in North Lecture Theatre 3 (off the Humanities Courtyard). If you have any items for the agenda please see Vanessa Edmonds (Secretary). Only financial members can attend; if you have not paid your AACAI membership for 2009 please see Jo McDonald (Membership Secretary).

Conference Dinner

The Conference Dinner will be held at the National Wine Centre adjacent to the Botanic Gardens in the centre of Adelaide on the evening of Monday 14 December 2009 from 7 pm - 11 pm. The cost for the dinner is $75, and this includes a three course meal and drinks package. Poster and paper prizes will be presented during the dinner, as well as the Big Man Award and Small Boy Awards. The evening will include a DJ, and arrangements have been made for delegates to convene to a nominated local bar (the Stag Hotel) after the Wine Centre closes.

Booksellers and Exhibitors

A secure room in the Humanities Courtyard has been reserved for booksellers and other exhibitors. This room will be staffed throughout the conference, from 8.30 am until 5.30 pm, including morning tea, lunch and afternoon tea breaks. If you are an exhibitor, please see Exhibitor Co-ordinator Donald Pate at registration. At the time of going to press the following organisations had confirmed as exhibitors:

- Antiquity
- Pandanus Press
- Australian Archaeological Association
- Flinders University Archaeology Society
- South Australian Museum

Summary Program

CODES: HUM = Humanities Courtyard, Flinders University
MFLT = Matthew Flinders Lecture Theatre, Flinders University
NLT3 = North Lecture Theatre 3, Flinders University,
NWC = National Wine Centre, Adelaide City
HET = Hetzel Lecture Theatre, Institute Building, State Library of South Australia, North Terrace, Adelaide City

Thursday 10 December 2009

9.00 am – 5.00 pm	Introduction to Geophysics Workshop with Ian Moffat
2.00 pm – 5.30 pm	Registration Desk Open; *Art from Injalak* Exhibition Open
5.30 pm – 8.30 pm	Welcome Drinks and BBQ (includes Official Opening of *Art from Injalak* Exhibition by Vincent Megaw)

Friday 11 December 2009

8.40 am – 9.10 pm	Official Conference Opening and Welcome (MFLT)
9.10 am – 10.30 am	Session 1: *Traces in the Sand: Landscape Evolution and Human History in the Willandra Lakes World Heritage Area* (MFLT)
10.30 am – 11.00 am	Morning Tea (HUM)
11.00 am – 12.20 pm	Session 1: *Traces in the Sand: Landscape Evolution and Human History in the Willandra Lakes World Heritage Area* (MFLT)
12.20 pm – 1.30 pm	Lunch (HUM)
1.30 pm – 2.30 pm	Session 1: *Traces in the Sand: Landscape Evolution and Human History in the Willandra Lakes World Heritage Area* (MFLT)
2.30 pm – 3.00 pm	Afternoon Tea (HUM)
3.00 pm – 5.20 pm	Session 2: *Archaeology and Anthropology* (MFLT)
5.30 pm – 7.30 pm	AAA Annual General Meeting (NLT3)
7.00 pm – 8.00 pm	Dinner (HUM)
8.00 pm – 9.00 pm	Poster Session (HUM)

Saturday 12 December 2009

8.50 am –10.30 am	Session 3: *Archaeology to Excite and Inspire* (MFLT)
10.30 am – 11.00 am	Morning Tea (HUM)
11.00 am – 12.50 pm	Session 3: *Archaeology to Excite and Inspire* (MFLT) Session 5: *Lithics in Contemporary Australian Archaeology* (NLT3)
12.50 pm – 2.00 pm	Lunch (HUM)
2.00 pm – 3.30 pm	Session 4: *Google Earth, Open Source and other Emerging Spatial Technologies: Innovation and Application in Archaeology* (MFLT) Session 6: *Old Guard Interviews* (NLT3)
3.30 pm – 4.00 pm	Afternoon Tea (HUM)
4.00 pm – 5.20 pm	Session 4: *Google Earth, Open Source and other Emerging Spatial Technologies: Innovation and Application in Archaeology* (MFLT) Session 6: *Old Guard Interviews* (NLT3)

5.30 pm – 7.30 pm	AAACA Annual General Meeting (NLT3)
6.30 pm – 7.30 pm	Complimentary Wine Tasting (HUM) Launch of Jane Lydon's new book *Fantastic Dreaming: The Archaeology of an Aboriginal Mission* (published by AltaMira) (HUM)
7.30 pm – 8.30 pm	Dinner (HUM)
8.30 pm – 9.30 pm	Photography Session (HUM)

Sunday 13 December 2009

9.10 am –10.30 am	Session 7: *Offerings from Old and New Guard Archaeologists* (MFLT) Session 8: *"Old Problems New Shit" or "Old Paradigms, New Applications": The Application of Cultural Heritage Legislation in Modern Cultural Heritage Situations* (NLT3)
10.30 am – 11.00 am	Morning Tea (HUM)
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12.30 pm – 1.30 pm	Lunch (HUM)
1.30 pm – 2.50 pm	Session 9: *Palaeoecology and its Role in Archaeology: Current Research and Future Directions* (MFLT) Session 10: *Seeing Beneath the Soil: The Possibilities of Archaeological Geophysics in Australia* (NLT3)
2.50 pm – 3.20 pm	Afternoon Tea (HUM)
3.20 pm – 4.40 pm	Session 9: *Palaeoecology and its Role in Archaeology: Current Research and Future Directions* (MFLT) Session 10: *Seeing Beneath the Soil: The Possibilities of Archaeological Geophysics in Australia* (NLT3)
4.45 pm – 5.15 pm	Presentation: *The Australian Research Council: Policy, Programs, Processes, Prospects – Assoc Prof Claire Smith, ARC College of Experts* (MFLT)
7.00 pm – 9.00 pm	Public Lectures (HET) Prehistoric Exploration of the World's Longest Cave Patty Jo Watson Time of Trouble, Time of Change: AD 1250-1350 in the American Southwest Bill Lipe

Monday 14 December 2009

8.50 am –10.30 am	Session 11: *The Archaeology of Australasian Coasts and Islands* (MFLT) Session 12: *The Real Dirt Game: Archaeology and Mining in the Pilbara* (NLT3)
10.30 am – 11.00 am	Morning Tea (HUM)
11.00 am – 12.50 pm	Session 11: *The Archaeology of Australasian Coasts and Islands* (MFLT) Session 13: *New Data and Reinterpretations of Pleistocene Australia* (NLT3)
12.50 pm – 1.50 pm	Lunch (HUM)
1.50 pm – 3.10 pm	Session 14: *Engaged Archaeology, Consultancies and Management Planning: Research Directions* (MFLT) Session 15: *Applying Digital and Mobile Technologies for In Situ Heritage and Tourism Management* (NLT3)
3.10 pm – 3.40 pm	Afternoon Tea (HUM)
3.40 pm – 5.00 pm	Plenary Session by Professor Geoff Bailey: *World Prehistory Inside and Outside Australia, Above and Below Sea Level* (MFLT)
7.00 pm – 11.00 pm	Conference Dinner (NWC)

Tuesday 15 December 2009

Optional day trips to wineries in McLaren Vale, Barossa Valley and Adelaide Hills
Optional day trip to the South Australian Museum Hindmarsh Storage Facility

Detailed Program

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5.30 pm – 8.30 pm	Welcome Drinks and BBQ (includes Official Opening of *Art from Injalak* Exhibition by Vincent Megaw)

Friday 11 December 2009

8.40 am – 9.10 pm	Official Conference Opening and Welcome (MFLT) Vice-Chancellor of Flinders University, Professor Michael Barber Kaurna Welcome to Country Darpinjung Talkinjeri Dancers

Session 1: *Traces in the Sand: Landscape Evolution and Human History in the Willandra Lakes World Heritage Area* (MFLT)

9.10 am – 9.30 am	Introduction Elders from the Willandra Lakes World Heritage Area
9.30 am – 9.50 am	A New Generation of Archaeological and Geological Research in the Willandra Lakes World Heritage Area: An Introduction to the ARC-Linkage Project, The Environmental Evolution of the Willandra Lakes World Heritage Area Rainer Grün and Nicola Stern
9.50 am – 10.10 am	A Preliminary Chronological Framework for the Lake Mulurulu Lunette Tegan E. Kelly, Rainer Grün, Ian Moffat, Kathryn E. Fitzsimmons, Daryl Pappin and Cally Doyle
10.10 am – 10.30 am	Detailed Geoarchaeological Investigations of the Northern Mungo Lunette Ian Moffat, Rainer Grün, Tegan E. Kelly and Daryl Pappin
10.30 am – 11.00 am	Morning Tea
11.00 am – 11.20 am	Towards a Chronological Framework for Human Response to Environmental Change at Lake Mungo Timothy T. Barrows, Kathryn E. Fitzsimmons, Nicola Stern, Jacqueline Tumney, Daryl Pappin and Rainer Grün
11.20 am – 11.40 am	Working on Country in the Willandra Lakes World Heritage Area Daryl Pappin
11.40 am – 12.00 noon	Shifting Sands: The Empirical Structure of the Mungo Archaeological Record and its Implications for Landscape Archaeology Nicola Stern
12.00 noon – 12.20 pm	A GIS Perspective on the Mungo Lunette Surface Material Jacqueline Tumney

12.20 pm – 1.30 pm	Lunch
1.30 pm – 1.50 pm	Notched Artefacts from the Willandra Lakes World Heritage Area Rebekah Kurpiel
1.50 pm – 2.10 pm	The Study of Faunal Assemblages from Open Dites in the Willandra Lakes: S Case Study from Locality 969660 Marnie Kibble
2.10 pm – 2.30 pm	Tur-rat, Kunpali and Pirlatya: Hare Wallabies, Fish and Mussels. Recent Investigations Concerning the Archaeology of Food, Willandra Lakes Region Harvey Johnston
2.30 pm – 3.00 pm	Afternoon Tea
	Session 2: *Archaeology and Anthropology* (MFLT)
3.00 pm – 3.20 pm	Archaeology and Anthropology: An Introduction Neale Draper and Fiona Sutherland
3.20 pm – 3.40 pm	Panel Discussion using Field Examples Traditional owners from Kaurna (South Australia) and Martidja Banyjima (Western Australia), with Neale Draper and Fiona Sutherland
3.40 pm – 4.00 pm	From Moth Hunters to Mungo: Indigenous Insights into Recent and Prehistoric Archaeology Josephine Flood
4.00 pm – 4.20 pm	Past and Present: Art of the Canning Stock Route Samantha Higgs
4.20 pm – 4.40 pm	The Logic of Wik Camping, Cape York Peninsula Peter Sutton
4.40 pm – 5.00 pm	Observations of a Multi-Disciplinary Researcher Working in Native Title Amy Roberts
5.00 pm – 5.20 pm	Could Stanner have Wagered his Hat? Did Yao Ancestors (1966-69) Maintain Inherited Rockeries for Poppy Production on Little Elephant's Peak in Northern Thailand? Douglas Miles
5.30 pm – 7.30 pm	AAA Annual General Meeting (NLT3)
7.00 pm – 8.00 pm	Dinner (HUM)
8.00 pm – 9.00 pm	Poster Session: Louise Holt (Convenor) (HUM)

Saturday 12 December 2009

Session 3: *Archaeology to Excite and Inspire* (MFLT)

8.50 am – 9.10 am	Digging at Fromm's Landing Half a Century Ago John Mulvaney
9.10 am – 9.30 am	Blank on the Archaeological Map - Five Decades of Exploration and Discovery in Australia Josephine Flood
9.30 am – 9.50 am	The Romance of the North: Adventures in the Archaeology of Western Arnhem Land Harry Allen
9.50 am – 10.10 am	Reflections of an Old Guard Jack Golson
10.10 am – 10.30 am	"It Found Us, We Didn't Find It": How an Archaeological Discovery in Vanuatu has Changed the Game in Pacific Archaeology Matthew Spriggs and Stuart Bedford
10.30 am – 11.00 am	Morning Tea
11.00 am – 11.20 am	Fruits, Nuts and Vegetables: Archaeological Dissonance in Sahul Tim Denham
11.20 am – 11.40 am	'Dead Men and Dreamings': Some Reflections on An-barra Archaeology Sally Brockwell
11.40 pm – 12.00 noon	Mr Duniam and his Mummy Chris Carter
12.00 noon – 12.20 pm	The 1990s Central Australia Archaeology Project Judy Birmingham
12.20 pm – 12.40 pm	Buggering Around in the Backyard: Creating Attachment to Place through Archaeology and Materiality Steve Brown

Session 5: *Lithics in Contemporary Australian Archaeology* (NLT3)

11.00 am – 11.20 am	The Nature and Distribution of Stone Artefacts in Northwest Victoria Jeffrey Hill
11.20 am – 11.40 am	Using Archaeomagnetism to Identify Heat Treatment and Sourcing of Silcrete Stone Tools: Results from Experimental Studies and the Middle Stone Age of South Africa Andy I.R. Herries, Kyle Brown, David Braun, Erich Fisher, Zenobia Jacobs, Curtis Marean and Chantal Tribolo
11.40 am – 12.00 noon	Recent Investigations at Karara, Western Australia and Future Directions for a Regional Archaeology Ben Fordyce and Lyndon Patterson
12.40 pm – 2.00 pm	Lunch

Session 4: *Google Earth, Open Source and other Emerging Spatial Technologies: Innovation and Application in Archaeology* (MFLT)

2.00 pm – 2.15 pm	OpenHeritage Australia Illya Santos
2.15 pm – 2.30 pm	Serving with Google Maps Andrew Wilson
2.30 pm – 2.45 pm	Building Software for Archaeology UWA Computer Science and Systems Engineering Students
2.45 pm – 3.00 pm	Exploring the Inaccessible: A Case Study using Google Earth Karen Henderson
3.00 pm – 3.15 pm	Accessible GIS: Archaeological Site Models in Google Earth Stafford Smith
3.15 pm – 3.30 pm	Cultural Site Management Systems: Technology for Recording and Managing Archaeological Sites Troy Mallie

Session 6: *Old Guard Interviews* (NLT3)

2.00 pm – 2.45 pm	Jack Golson Interview
2.45 pm – 3.30 pm	John Mulvaney Interview
3.30 pm – 4.00 pm	Afternoon Tea

Session 4 cont.: *Google Earth, Open Source and other Emerging Spatial Technologies: Innovation and Application in Archaeology* (MFLT)

4.00 pm – 4.15 pm	Rio Tinto Coal Australia's Development and Use of Innovative GIS/GPS Technologies and Methodologies as Cultural Heritage Management Tools in the Coal Mining Sector David Cameron
4.15 pm – 4.30 pm	Old Dog, New Tricks: Using GIS in Cultural Heritage Management Jo McDonald
4.30 pm – 4.45 pm	SahulTime and TemporalEarth: A Step towards Digital Earth? Matt Coller
4.45 pm – 5.00 pm	Investigating the Submerged Post-Glacial Landscapes of Port Phillip Bay Hannah Steyne
5.10 pm – 5.30 pm	Discussion and Questions

Session 6 cont.: *Old Guard Interviews* (NLT3)

4.00 pm – 4.45 pm	Val Attenbrow Interview
4.45 pm – 5.30 pm	Jo Flood Interview
5.30 pm – 7.30 pm	AACAI Annual General Meeting (NLT3)
6.30 pm – 7.30 pm	Complimentary Wine Tasting (HUM) Launch of Jane Lydon's *Fantastic Dreaming: The Archaeology of an Aboriginal Mission* (published by AltaMira) (HUM)
7.30 pm – 8.30 pm	Dinner (HUM)
8.30 pm – 9.30 pm	Photography Session (HUM)

Sunday 13 December 2009

Session 7: *Offerings from Old and New Guard Archaeologists* (MFLT)

9.10 am – 9.30 am	The Archaeological Implications of Advances in Construction Methodologies: How Linear Trenchless Construction can Reduce the Construction Impact on Archaeological Sites Faye Prideaux
9.30 am – 9.50 am	Upping the Ante: The Logistics of Bringing a Large-Scale Archaeological Excavation in Line with the Health and Safety Systems of the Mining Industry Elspeth MacKenzie
9.50 am – 10.10 am	Gender, Mobility and Technology: Interpreting Spatial Distributions of Arrow and String Bag Characteristics in the Upper Sepik and Central New Guinea Andrew Fyfe and Jill Bolton
10.10 am – 10.30 am	Understanding Past Noongar Land Management: Further Research in the Pallinup Catchment, South-Coastal Western Australia Joe Dortch, David Guilfoyle, Ken Hayward, Jane Balme, Fiona Dyason and Ellie Rusack

Session 8: *"Old Problems New Shit" or "Old Paradigms, New Applications": The Application of Cultural Heritage Legislation in Modern Cultural Heritage Situations* (NLT3)

9.10 am – 9.30 am	Defining Heritage – Reality and Practice Challenge the Narrow Confines of the Law: A Case Study of Heritage 'Boundaries' at the Gummingurru Stone Arrangement Site Annie Ross
9.30 am – 9.50 am	It's my Party: Aboriginal Parties in Queensland, ILUAs, the *Aboriginal Cultural Heritage Act* and the Federal Court Luke Godwin
9.50 am – 10.10 am	A Town Planner's View on Queensland's Cultural Heritage Legislation Kate Greenwood
10.10 am – 10.30 am	The Developer's Golden Ticket? A Case Study in Cultural Heritage Management in Western Sydney under Part 3A of the *NSW Environmental Planning and Assessment Act 1979* Sam Moody
10.30 am – 11.00 am	Morning Tea

Session 7 cont.: *Offerings from Old and New Guard Archaeologists* (MFLT)

11.00 am – 11.20 am	The Movement of People from Borneo to Madagascar - Was There Contact in the Maldives? Mirani Litster
11.20 am – 11.40 am	Attempts to Date some Rock Art Sites in the Cue Region, Western Australia Esmée Webb
11.40 am – 12.00 noon	Recent Research at Mulka's Cave, an Aboriginal Rock Art Site in SW Australia: The Implications of the Erosional Effects of Cultural Tourism Alana Rossi
12.00 noon – 12.20 pm	Archaeological Investigations of Rock Art at Middle Park Station, Northwest Queensland Victoria Wade and Lynley A. Wallis

Session 8 cont.: *"Old Problems New Shit" or "Old Paradigms, New Applications": The Application of Cultural Heritage Legislation in Modern Cultural Heritage Situations* (NLT3)

11.00 am – 11.20 am	Assessing the Condition of Heritage Values: A Response to Shifting Implementation of the EPBC Act Laura Farquharson
11.20 am – 11.40 am	Ngarinyin Cultural Transmission and 'Caring for our Country' Heather Winter
11.40 am – 12.00 noon	Auditing Cultural Heritage: A Second Opinion Can Count Sue Smalldon
12.00 noon – 12.20 pm	The New *Victorian Aboriginal Heritage Act 2006*: A Registered Aboriginal Party's Perspective Megan Goulding, Darren Griffin and Wurundjeri Elders

12.20 pm – 1.30 pm Lunch

Session 9: *Palaeoecology and its Role in Archaeology: Current Research and Future Directions* (MFLT)

1.30 pm – 1.50 pm	Ground Stone Tools from Shangshan Site, South China: Integrating Microresidue and Use-Wear Studies in the Reconstruction of Early Holocene Chinese Subsistence Practices Duncan Jones
1.50 pm – 2.10 pm	Residue Analysis of Peiligang-Aged (8500-7000BP) Stone Sickles from Central China Sheahan Bestel
2.10 pm – 2.30 pm	The Big Game Hunters? Zooarchaeological Analysis from the Middle Palaeolithic of Longyadong Cave, Luonan Basin, China Jillian Garvey, Richard Cosgrove, Shejiang Wang, Song-mei Hu and Wei Ming
2.30 pm – 2.50 pm	Diet and Health Status at Chinikiha, Chiapas, Mexico: Some Preliminary Results Coral Montero López, Luis Fernando Núnez, Pedro Morales, Edith Cienfuegos and Francisco Otero

Session 10: *Seeing Beneath the Soil: The Possibilities of Archaeological Geophysics in Australia* (NLT3)

1.30 pm – 1.50 pm Magnetism and Prehistory in Australia: Possibilities and Problems
Ian Moffat, Lynley Wallis, Ben Keys, Rob Koch, Mark Hounslow, Alice Beale, Kate Domett and Louise Holt

1.50 pm – 2.10 pm Special Cases In Near Surface Geophysical Investigation: Examples Of 2D, Quasi-3D, And True-3D Resistivity Imaging For Mapping Archaeological Remains
Aaron Fogel

2.10 pm – 2.30 pm Geophysical Anomaly Testing with Down-Hole Magnetic Susceptibility
Kelsey Lowe

2.30 pm – 2.50 pm Sand, Silt, Clay: The Effect of Grain Size on the Geophysical Responses of Indigenous Burial Sites
David C. Nobes

2.50 pm – 3.20 pm Afternoon Tea

Session 9 cont.: *Palaeoecology and its Role in Archaeology: Current Research and Future Directions* (MFLT)

3.20 pm – 3.40 pm On Common Sense: Dead Kangaroos, Game Cameras and the Construction of Uniquely Australian Taphonomic Models
Melanie Filios

3.40 pm – 4.00 pm Emu Butchery and Economic Utility: Implications for Understanding Australian Zooarchaeology and Megafaunal Extinctions
Brett Cochrane, Jillian Garvey, Chris Boney and Judith Field

4.00 pm – 4.20 pm Mounds - A Palaeoecological 'Treasure-Chest'
Sarah Martin

4.20 pm – 4.40 pm Archaeological and Palaeoecological Investigations of a Probable Late Pleistocene Assemblage from Nerang, South East Queensland
Michael Westaway, Hague Best, Patrick Moss, Craig Sloss and Tamara Daus

Session 10 cont.: *Seeing Beneath the Soil: The Possibilities of Archaeological Geophysics in Australia* (NLT3)

3.20 pm – 3.40 pm Geophysical Imaging of an Early 19th Century Colonial Defensive Blockhouse
David C. Nobes and Lynda R. Wallace

3.40 pm – 4.00 pm Managing Shipwrecks you can't see: Geophysics & Historic Shipwreck Sites
Hannah Steyne

4.00 pm – 4.20 pm Efficient, Large-Scale Archaeological Prospection using a True 3D GPR Array System
Mads Toft

4.45 pm – 5.15 pm The ARC: Policy, Programs, Processes, Prospects - Claire Smith

7.00 pm – 9.00 pm Free Evening Public Lectures (HET)
Prehistoric Exploration of the World's Longest Cave - Patty Jo Watson
Time of Trouble, Time of Change: AD 1250-1350 in the American Southwest - Bill Lipe

Monday 14 December 2009

Session 11: *The Archaeology of Australasian Coasts and Islands* (MFLT)

9.10 am – 9.30 am	Change and Continuity in Ngarrindjeri Ruwe (Country): Understanding Riverine Lifeways in the Lower Murray Chris Wilson
9.30 am – 9.50 am	An Archaeological Study of Shell Middens at the Coorong, SA Claire St George, Lynley Wallis, Chris Wilson, Steve Hemming and Ngarrindjeri Heritage Committee
9.50 am – 10.10 am	Using Archaeological Otoliths to Determine Palaeoenvironmental Change and Ngarrindjeri Resource Use in the Coorong , SA Morgan Disspain, Lynley Wallis, Bronwyn Gillanders and Ngarrindjeri Heritage Committee
10.10 am – 10.30 am	Stone Arrangements of the Bonaparte Archipelago: Results of an Archaeological Survey of Offshore Islands of the Bonaparte Archipelago, NW Kimberly Coast, Western Australia Darren Cooper and Joe Mattner

Session 12: *The Real Dirt Game: Archaeology and Mining in the Pilbara* (NLT3)

8.50 am – 9.10 am	Issues of Archaeological Significance Assessment in the Eastern Pilbara: Some Preliminary Thoughts Alex MacKay, Alistair Grinbergs, Phillip Hughes, Marjorie Sullivan and Doug Williams
9.10 am – 9.30 am	An Evolutionary Approach to Flaked Stone Artefact Technology in the Inland Pilbara Michael Slack and Amy Stevens
9.30 am – 9.50 am	The Pleistocene Archaeological Record at Hope Downs 1, Western Australia Dawn Cropper and Boone Law
9.50 am – 10.10 am	The Holocene Archaeological Record at Hope Downs 1, Western Australia Boone Law and Dawn Cropper
10.10 am – 10.30 am	Aboriginal Tool Stone of the Central Hamersley Range, Pilbara, Northwestern Australia Richard Fullagar, Michael Slack, Paul Carr, Brian Jones and Penny Williamson

10.30 am – 11.00 am Morning Tea

Session 11 cont.: *The Archaeology of Australasian Coasts and Islands* (MFLT)

11.00 am – 11.20 am	Climate Change Records from North Australian Cultural Midden Deposits: Evidence from a Pilot Study of Oxygen Isotopes in Mollusc Shells Sally Brockwell, Ben Marwick, Patricia Bourke, Patrick Faulkner and Richard Willan
11.20 am – 11.40 am	What Happens when a Landbridge becomes a Group of Islands? Duncan Wright
11.40 am – 12.00 noon	Defining the Criteria for Describing and Classifying Shell Mounds Vanessa Alexander

12.00 noon – 12.20 pm Specialised Sites or Taphonomic Bias? A Review of Factors Influencing the Preservation of Non-Molluscan Faunal Remains in Shell Mound Deposits in Northern Australia
Michael Morrison

12.20 pm – 12.40 pm 'The Way it Changes, like the Shoreline and the Sea': The Sandalwood River Archaeological Project, Mornington Island, Gulf of Carpentaria
Dan Rosendahl, Sean Ulm, Richard Robins, Errol Stock, Paul Memmott and Geraldine Jacobsen

Session 13: *New Data and Reinterpretations of Pleistocene Australia* (NLT3)

11.00 am – 11.20 am Behavioural Modernity in Sahul's Pleistocene Archaeological Record: Taphonomy, Archaeological Sampling and Previous Hypotheses
Michelle Langley

11.20 am – 11.40 am Gledswood 1 Shelter: Initial Radiocarbon Dates from a Pleistocene Aged Rockshelter Site in Northwest Queensland
Lynley A. Wallis, Ben Keys, Ian Moffat and Stewart J. Fallon

11.40 am – 12.00 noon Excavations at Parnkupirti, Lake Gregory, Great Sandy Desert: OSL Dates for Occupation before the Last Glacial Maximum
Peter Veth, Mike A. Smith, Jim Bowler, Kathryn E. Fitzsimmons, Alan Williams and Peter Hiscock

12.00 noon – 12.20 pm Dating the Initial Colonisation of Sahul: Why There is a Discrepancy Between 14C and TL, OSL, ESR, AAR and U-series and Why it Should Matter to the 'New Guard'
Esmee Webb

12.20 pm – 12.40 pm The Role of Information Exchange in the Colonisation of Sahul
Peter Veth, Nicola Stern, Jo McDonald, Jane Balme and Iain Davidson

12.50 pm – 1.50 pm Lunch

Session 14: *Engaged Archaeology, Consultancies and Management Planning: Research Directions* (MFLT)

1.50 pm – 2.10 pm Negotiating the Ngarrindjeri Heritage Program and Closing the Gap
Steve Hemming, Daryle Rigney and the Ngarrindjeri Regional Authority

2.10 pm – 2.30 pm 'Documenting Ourselves': The Use of Film in Articulating the Complexities of Repatriation and Reburial in Ngarrindjeri Ruwe
Christopher Wilson, Tom Trevorrow, David Wilson and Albert Lovegrove Buckskin

2.30 pm – 2.50 pm Connection and Continuation – Ngarrindjeri Caring for Country Management Planning within the Lower Lakes, South Australia
Kelly Wiltshire and Ngarrindjeri Lands and Progress Association

2.50 pm – 3.10 pm All Aboard: Longer Term Cultural Heritage Research and Management with the Wajarri of the Weld Range
Vicky Winton and Viviene Brown

Session 15: *Applying Digital and Mobile Technologies for In Situ Heritage and Tourism Management* (NLT3)

1.50 pm – 2.10 pm	Augmenting the Archive: Extending Australia's Audio-Visual Heritage at Cold War Sites Mick Broderick
2.10 pm – 2.30 pm	The Brumby and the Bomb: Archaeology at Maralinga Alice Gorman
2.30 pm – 2.50 pm	Designing the Virtual for Immersive Heritage Experiences Josh Whitkin
2.50 pm – 3.10 pm	Representing Heritage: Location Based Mobile Virtual Environments Shri Rai
3.10 pm – 3.40 pm	Afternoon Tea
3.40 pm – 4.40 pm	Plenary Session: World Prehistory Inside and Outside Australia, Above and Below Sea Level Geoff Bailey
7.00 pm – 11.00 pm	Conference Dinner (NWC)

Tuesday 15 December 2009

Optional day trips to wineries in McLaren Vale, Barossa Valley and Adelaide Hills
Optional day trip to the South Australian Museum Hindmarsh Storage Facility

Poster Session Program

Convenors: Louise Holt and Toni Massey

Investigations in Invasion Innovation
W. Shawn Arnold

Investigating Rock Varnish Formation with Sequential Extraction
Maxime Aubert, Marc Richer-LaFlèche and Alan Watchman

Portable X-Ray Fluorescence of Edge Ground Hatchet Heads: Problems and Prospects
Val Attenbrow, Lin Sutherland, Ross Pogson and Peter Grave

The Value and Importance of Conservation Training for Archaeologists
Sam Bell

Understanding Archaeology: The DPC-AARD and Flinders University Heritage Site Recording Workshops
Peter Birt and Michael Diplock

Playing God with History? Creating 'Wild Nature' from Living Landscapes
Steve Brown

Investigating Prehistoric Occupation Intensity and Noongar Mobility Patterns in Southwestern Australia
Richard E. Cameron

The Study of Internal Growth Lines on *Anadara granosa* from the Abydos Plain, Coastal Pilbara, WA, Australia
Hahjung Chin, Stewart J. Fallon and Anthony J. Barham

Aboriginal Technological Organisation at Kurnell, Botany Bay, New South Wales
John Connelly

A Word to the Brave: Some Hints and Tips on the Preparation of a Skeletal Reference Collection
Sarah L. Croker and Denise Donlon

Keeping Country: An Introduction to Aboriginal and Torres Strait Islander Cultural Heritage Management
Andrew Fairbairn, Pat Faulkner, Annie Ross and Sean Ulm

Training the Archaeologists of the Future
Keith Hall, Annabelle Davis and Luke Lowery

'Dead Men Do Speak': The Collection, Display and Interpretation of Heads within Western Museums
Tanja Harding

Maludong: New Research at a Modern Human Site in Yunnan Province, Southern China
Andy I.R. Herries, Darren Curnoe, Ji Xueping and Paul Tacon

New Guard Archaeologists ♥ FB
Louise Holt and Kylie Lower

Application of Portable X-Ray Fluorescence to *In Situ* Analysis of Rock Art: Experiments in Spatial Geochemical Modelling
Jillian Huntley, June Ross and Peter Grave

Umbo Dissolution Patterns in a Sample of Blood Cockle *Anadara granosa* (L.) from Port Hedland, Western Australia
Nicholas Nedeljkovic

Weed Seeds of the Australs: Toward Establishing a Reference Collection for Palaeoecological Application
Shawn O'Donnell and Mat Prebble

The Development of the South Australian Museum's New Research Facility at Hindmarsh
Daniel Petraccaro and Keryn Walshe

To See with New Eyes: A Phenomenological Investigation of a Contact Landscape at the Weipa 'Twenty Mile' Mission, North-Western Cape York Peninsula, Queensland
Claire Ratican, Michael Morrison and Alice Gorman

An Investigation of Hunter-Gatherer Mobility in the South West of Western Australia: Moorillup Pool, Kalgan Hall, Burswood and Hunter River East
Wendy Reynen

Old 'Dingoes', New Tricks: An Actualistic Study of Dingo Scat-Bone 'Signature Patterns' applied to Faunal Assemblages from Witchcliffe Rock Shelter
Jess Reynolds

Palaeoecological Investigation of the Human Occupation of Rainforest on the Atherton Tablelands, North Queensland
Lincoln Steinberger, Patrick Moss, Simon Haberle, Richard Cosgrove and Asa Ferrier

Archaeological Action Figures: A Fun Approach to Archaeological Theory and Method
Cassandra Taylor, Shannon Smith, Bianca Petruzzelli and Sarah Keillor

Technological Responses to the Submergence of Fossiliferous Chert Sources in the South West of Western Australia
Hollee Worrell

Paper and Poster Abstracts

Paper Monday 14 December 11.40 am – 12.00 noon	Defining the Criteria for Describing and Classifying Shell Mounds Vanessa Alexander

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Shell mounds are a well known component of Australian coastal archaeology. Their often dramatic form and high visibility has made them easily identifiable as markers of prehistoric coastal occupation. Their physical prominence suggests there should be clear identification criteria for differentiating between shell mounds and other forms of shell middens. A comprehensive review of the literature has revealed the opposite. The criteria for differentiating between shell mounds and other forms of shell middens are confused and contradictory. This issue has become increasingly important as archaeologists have begun to interpret shell mounds as a distinct site type representing strong symbols of cultural expression with a role in ritual and ceremony. Therefore achieving consistency and clarity about what criteria differentiates between a shell mound and other shell midden forms is critical for comparative discussion and the compilation of site type data. In this paper I present an overview of the problems and propose a set of criteria for distinguishing between shell mounds and other forms of shell middens.

Paper Saturday 12 December 9.30 am – 9.50 am	The Romance of the North: Adventures in the Archaeology of Western Arnhem Land

Harry Allen

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In 1939, Donald Thomson published his classic account of seasonal variations of Aboriginal culture on Cape York Peninsula. This was followed 30 years later by Carmel Schrire (White) and Nic Peterson's equally classic paper 'Ethnographic interpretation of the prehistory of western Arnhem land'. These papers, and Carmel's PhD project, set the scene for my own work in western Arnhem Land, an early contract surveying archaeological sites as part of the Alligator Rivers Environmental Fact Finding Study. The paper will discuss my romance with western Arnhem Land and changing archaeological interpretations and involvements. It will also pay due respect to the Aboriginal contribution to archaeological knowledge over this time.

Poster	Investigations in Invasion Innovation

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Flinders University recently partnered with the U.S. non-profit organization “Ships of Discovery” to create a maritime heritage trail for the World War II invasion beaches of Saipan (Pacific) funded through a National Park Service Battlefield Protection Grant. In July 2009 a team of archaeologists conducted initial assessments of potential sites to be included on this trail. One of the sites examined was a sunken amphibious tank known by the U.S. military as a Landing Vehicle Tracked (Armored) 4 or LVT(A)-4. This vehicle saw its first combat action in Saipan: its introduction affected every component of naval warfare and the way invasions were planned. The particular LVT(A)-4 examined in Saipan was determined to be an early production model, based on its having a 75-mm Howitzer turret with a single .50-caliber machinegun mount. However, rather than being “off-the-production line”, it demonstrates battle modifications in the form of square armour plating around the machinegun mount (circular armoured shielding was later added as a standard by the manufacturer) and the addition of a ball mounted .30-caliber machinegun at the radio operators seat in the cab. Studying this machine has offered a rare opportunity to directly correlate the actions of LVT crews to the production and manufacture of amphibious vehicles. The fact that the LVT(A)-4 was not in use prior to the Saipan invasion allows the modifications to be studied synchronically. Researchers are able to trace these modifications diachronically through the seriation of LVT production, offering a glimpse into the morphology of amphibious warfare machines.

Poster	Portable X-Ray Fluorescence of Edge Ground Hatchet Heads: Problems and Prospects

Val Attenbrow[1], Lin Sutherland[2], Ross Pogson[3] and and Peter Grave[4]

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Application of Portable X-Ray Fluorescence (PXRF) hardware and software (the Bruker III-V and Artax systems) to archaeological artefacts, particularly obsidian, indicates that the accuracy and precision of this non-destructive analytic system is clearly better than "old guard" destructive methods. In museum contexts where destructive analysis is no longer acceptable and the transportability of artefacts is highly constrained, field portable PXRF is proving a powerful technique for generating elemental "fingerprints" in-house. However, moving from the homogenous, glassy textures of obsidian to the compositionally and texturally heterogeneous fabrics of other volcanic and meta-volcanic stone tools, more typical of Australian archaeological assemblages, requires different approaches both to the generation of spectra and to their quantitative treatment. Using a test case of PXRF analysis of artefacts and volcanic sources in the Sydney Basin curated by the Australian Museum, we present the methodology and substantive results that showcase the success of this technique in matching artefacts to most likely point of origin.

Poster	Investigating Rock Varnish Formation with Sequential Extraction

Maxime Aubert[1,2], Marc Richer-LaFlèche[2] and Alan Watchman[3]

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Rock varnish covers many Australian rock art surfaces. Understanding the processes of formation is critical for constraining its age. We have investigated how rock varnish forms by studying the speciation of manganese, iron and the distribution of rare earth elements in a varnish sample and its supporting weathered and unweathered bedrock from Karolta, South Australia. It appears that the formation of manganese-rich rock varnish layers is a two-step process, starting with manganese enrichment in the weathered bedrock surface (compared to the unweathered sandstone). The mechanical weathering of this enriched crust, and its redeposition as windblown particulates, form the key ingredients of the varnish. In the presence of water accumulating periodically at the surface of the outcrop, manganese is dissolved from those windblown particulates and eventually forms manganese oxides, hydroxides and oxy-hydroxides. These cement the leached residual particulates and other accumulating debris, forming undulating layers. This process also concentrates mobile rare earth elements and occurs with or without the presence of micro-organisms, affecting the redox potential of the solution.

Keynote Address Monday 14 December 3.40 – 4.40 pm	World Prehistory Inside and Outside Australia, Above and Below Sea Level Geoff Bailey	SOCIETY OF ANTIQUARIES OF LONDON Since 1707  SA Museum

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I propose to reflect on two themes that have been a persistent point of reference in my own intellectual history and link to Australian interests. One is the distinctiveness of the archaeological record in Australia and the difficulties faced by the rest of the archaeological world in dealing with this. The other is the influence of coastlines and marine environments on human development and dispersal. Both themes have been shaped for me by an early experience of fieldwork in Australia and have informed an abiding interest in comparative archaeology at a world scale—not only comparison and contrast of archaeological records in different parts of the world, but comparison of the different intellectual traditions, preconceptions, and modes of interpretation that inform their study. Both sets of contrasts pose a persistent and unanswered question: to what extent can there be, or should there be, a unified framework of interpretation that is universally applicable? Despite all the contortions of the post-modern turn in intellectual fashion, this is a question that will not go away, and is too interesting to ignore.

When the deep Pleistocene history of human occupation on the Australian continent began fully to emerge in the 1970s, the evidence came as a great surprise. It challenged conventional narratives of world prehistory, and was at first greeted with disbelief in many quarters. The subsequent history of reactions has encompassed a range of views that have variously ignored the Australian evidence, viewed it as exotically and inexplicably different, or struggled more or less unsuccessfully to incorporate it into a wider world view. It is not clear, 40 years on, that the rest of the world has really caught up with the significance of the Australian evidence, or that from Australia that significance has been fully articulated to the rest of the world.

One cleavage of opinion refers to ethnography. My own experience in Australia, like that of many others, convinced me that despite its richness as a potential source of inspiration, ethnography is not the same thing as archaeology, and that while both are interesting in their different ways, a belief in ethnographic analogy was unsustainable, denying autonomy as an independent intellectual discipline to archaeology, and denying history to Indigenous communities actively engaged in the modern world. The implications are profound and well understood in Australia. Yet they have largely passed by a world of archaeological theory dominated by Anglophone traditions originating in the northern hemisphere, which continue to be deeply impressed by the power of ethnographic analogy, despite appearances to the contrary.

A second fundamental difference is that the rest of the world is still very much in love with the notion of world prehistory as a cumulative sequence of revolutions – human linguistic, symbolic, agricultural, urban, and so it goes on. Since the Australian continent participated in none of these or at best only as a receiver of innovations originating elsewhere, one of two things must follow. Either Australia was marginal to the main currents of development in the grand narratives of world prehistory, and has little or

nothing to contribute to this wider story, or the rest of the world is wrong in its assumptions about the pattern of prehistory, and we need a different way of looking at global narratives.

This leads me on to my second theme, of coastal and maritime exploration. In the past decade, we have witnessed the emergence of a powerful new synthesis about the dispersal of anatomically modern humans, stimulated in large part by the evidence of a sea-borne colonisation of Australia, and by advances in phylogenetic mapping, that modern humans originating in Africa made a rapid exit through the southern corridor of the Arabian Peninsula, and around the rim of the Indian Ocean, fuelled by new skills in marine exploitation and seafaring. This is part of a new and more widely articulated narrative, that all the great dispersals of human populations and the global expansion of the human habitat were driven by a coastal component of some sort.

I shall examine critically this notion from the perspective of recent fieldwork that we have been conducting in the Arabian sector of the southern Red Sea, the supposed stepping off point for this process of coast-wise dispersal. The biggest difficulty with this idea, which is in danger of becoming a new origin myth, is that for most of the period in question and for most of human history on this planet, sea levels have been far lower than the present, and most of the relevant evidence is now submerged. For most of the 20th century archaeologists have been in virtual denial about this problem, but there is now a new and concerted momentum to systematic exploration of the landscapes and archaeology of the continental shelf. Without this, all our current notions about early human dispersal will remain largely untested and untestable.

The outcome of these considerations is to suggest that the Australian experience, so far from being marginal or odd, may actually represent one of the best exemplars currently available for the way we should be thinking about prehistoric archaeology in other parts of the world, and that there is a distinctive Australian perspective or 'voice' in archaeological interpretation that the rest of the world would do well to pay attention to.

Paper Friday 11 December 11.00 am – 11.30 am	Towards a Chronological Framework for Human Response to Environmental Change at Lake Mungo Timothy T. Barrows[1], Kathryn E. Fitzsimmons[2*], Nicola Stern[3], Jacqueline Tumney[3], Daryl Pappin[3] and Rainer Grün[2]

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Lake Mungo, at the southern end of the Willandra Lakes World Heritage Area, is an icon of Australia's Indigenous heritage. The region was made famous as the site of the world's oldest known cremation and ritual ochre burial, as well as some of the earliest archaeological traces on the continent. The lunette in which the remains were found provides a rich archive not only of archaeological material, but also of past environmental change, recording alternating periods of permanent and ephemeral lake conditions reflecting climatic change through time. However, despite its high profile, Lake Mungo suffers from a relative dearth of systematic and integrated archaeological and palaeoenvironmental studies. Here we present a chronostratigraphic framework of parts of the Lake Mungo lunette not studied previously, using optically stimulated luminescence (OSL) dating techniques. OSL, a radiation exposure dating method which measures the time since sediments were last exposed to sunlight, is the ideal technique to use for dating wind-blown sediments such as those found within the Lake Mungo lunette. The high frequency sampling technique employed in this study provides critical information relating to both the timing and processes of sediment and artefact deposition. The OSL chronology elucidates the complexity of the lunette's stratigraphic record, enabling combination of the hydrological and environmental history with archaeological traces in a systematic and holistic way. Integration of the geological and archaeological information will provide a basis for understanding how Indigenous Australians in this region responded to long-term landscape and climate change.

Poster	The Value and Importance of Conservation Training for Archaeologists

Samantha Bell

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The need for conservation education has become a major factor in retaining information from excavated artefacts, especially those from underwater archaeological sites. The art of conserving on site, for short periods of time, and in transit has become a necessary aspect of training for archaeologists. Flinders University, in conjunction with the Western Australia Museum, offers a course that deals primarily in conservation knowledge necessary for archaeologists who work in marine environments; this is one of the very few such courses offered throughout Australia. It has taken many years for conservators to develop proper techniques for underwater artefacts; new methods are being developed and tested to this day. This poster emphasizes the importance of training underwater archaeologists in proper conservation techniques in hopes of inspiring the development of more programs to educate these techniques.

Paper Sunday 13 December 1.50 pm – 2.10 pm	Residue Analysis of Peiligang-Aged (8500-7000BP) Stone Sickles from Central China Sheahan Bestel

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A selection of the characteristic stone sickles from three Peiligang (8500-7000 BP) sites in the Yiluo River Basin region of central China were examined for plant residues. The sickles have always been assumed to have been used as cereal harvesting tools, however no use-wear studies have previously been carried out on this type of tool to confirm this hypothesis. An examination of the residues, including starch and phytoliths, from the tools has shed light on this debate.

Paper Saturday 12 December 12.00 noon – 12.20 pm	The 1990s Central Australia Archaeology Project Judy Birmingham

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The excitement and dedication of establishing historical archaeology at Sydney University fully occupied the 1970s and 1980s, coming of age with the major training excavation of the historic homestead of Regentville, NSW. To counter its settler-colonialist bias we developed an ARC project to investigate sites of interaction between settlers and indigenes where we knew there was far more evidence than on the East coast–missions, mines, police camps, pastoral homesteads, and telegraph repeater station sites from Adelaide to Darwin virtually all with rich archaeological data accessible on the surface.

We knew it would be different, but not just how exciting the next few years would be. The sites to be visited were listed as European heritage sites: our aim was to challenge the established status of these sites and in most cases we did, finding evidence for Aboriginal presence before, during and sometimes after the colonial presence which was recorded for later analysis. Our methods were intentionally innovative and non-disturbing – extensive surface survey, with artefact quantification and mapping, while applying new technologies increasingly available, especially GPS and GIS. The intellectual excitement of the concept was heightened in the event both by the absorbing fieldwork, and also of course by on-site camping in the desert, interactions with local communities and more than the usual expedition adventures. Thanks are due to all our team members, but most notably to my colleague, co-leader and master of field technologies Andrew Wilson

Poster	Understanding Archaeology: The DPC-AARD and Flinders University Heritage Site Recording Workshops Peter Birt and Michael Diplock

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Aboriginal communities are too often expected to manage their heritage sites in a world of developers, miners, government officials and lawyers, and where traditional knowledge has to be reconciled with broader heritage practices. Aboriginal people are often reliant on others to interpret traditional knowledge into meanings they may or may not understand. The aim of the Heritage Site Recording Workshops is to provide Aboriginal people with an understanding of archaeological practice and the skills to undertake basic site recording and site conservation planning.

Run over two to three days, the workshops discuss legislation, look at the reasons why sites are recorded and provide people with some basic skills to record sites, including mapping, the use of equipment, planning fieldwork, site identification and recording. We talk through some of the issues about managing site information once it is collected, in assessing site condition, undertaking site conservation planning and site monitoring.

We try to create a relaxed learning environment, where people old and young and from varied backgrounds, are comfortable asking questions and sharing their experiences. We have held 11 workshops in a little over three years, in locations ranging from Kingston in the South East to Witjira National Park in the far north. The only complaint we regularly get is that the workshops are too short and demand is growing.

A couple of days will not turn participants into archaeologists, but we can help people to better understand why and how things are done – reinforcing the experienced and encouraging those new to heritage. We cannot redress many of the imbalances in Aboriginal people having to make difficult heritage decisions in a complex environment, but the workshops help give people a better understanding of how their traditional knowledge and archaeology can complement each other.

Paper Saturday 12 December 11.20 am – 11.40 am	‘Dead Men and Dreamings’: Some Reflections on An-barra Archaeology Sally Brockwell

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In 1982, Betty Meehan published her seminal work *Shell Bed to Shell Midden*, which inspired a generation of researchers from shell midden studies to gastronomy. The book is based on her PhD and is about the role of shell fishing in the modern day economy of the An-barra people, a group of Australian Aborigines living on their traditional lands at the mouth of the Blyth River on the central Arnhem Land coast. Meehan describes a landscape covered in named places, both ritual and secular. One of her objectives was to set up ethnographic models that could be tested by the archaeology of the Blyth River. Together with her colleague Rhys Jones, another iconic figure in Australian archaeology, she investigated numerous late Holocene shell middens belonging to ‘dead men’, and shell mounds belonging to the ‘Dreaming’. The sites were recorded as part of the on-going An-barra Archaeological Project, with which I have been fortunate enough to be involved. This paper compares modern shellfish foraging patterns with some recent results from the Project. It demonstrates that subsistence activities recorded ethnographically differ from those revealed by the archaeological research, even though the time depth is not great. It also suggests that chronological shifts in economic and cultural strategies were linked to environmental changes in the landscape over the last 3500 years. It comments on the use of ethnographic analogy to interpret both economic and ritual use of archaeological sites, as well as suggesting a time depth for current ethnographic practices and the named landscape.

Paper Saturday 12 December 11.20 am – 11.40 am	Climate Change Records from North Australian Cultural Midden Deposits: Evidence From a Pilot Study of Oxygen Isotopes in Mollusc Shells Sally Brockwell[1], Ben Marwick[2], Patricia Bourke[3], Patrick Faulkner[4] and Richard Willan[5]

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Isotopic analysis of midden molluscs has not been conducted in Australia. In the case of the tropical northern Australian coast, an abundance of shell-bearing archaeological sites, many of which have been dated, provides a chronological framework to evaluate changes in isotope ratios. In this paper we present preliminary results of oxygen isotope analysis of bivalve shells from mounds in three geographically separate areas of the Top End of north Australia: *Anadara granosa* from west of Arnhem Land and northeastern Arnhem Land, and *Dosinia* cf. *laminata* from central Arnhem Land. The results demonstrate the potential of isotope analysis for identifying variations in temperature and rainfall, indicative of climate change, that were accompanied by human behavioural changes during the Late Holocene.

Paper Sunday 13 December 2.10 pm – 2.30 pm	Augmenting the Archive: Extending Australia's Audio-Visual Heritage at Cold War Sites Mick Broderick

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This paper aims to reveal that the currently perceived 'barren' topographies at Maralinga and Emu Field are, in fact, information rich, and a convergence point for a socially creative experience if we take advantage of augmented aural and visual or mixed reality technologies. A problem facing Maralinga tourism is that visitors may be unable or unwilling to travel to certain locales due to the large distances involved or because of their personal circumstances, including age, health and wealth. Former and current restrictions formally placed on access to Cold War/atomic sites may still provoke fear, or actual danger, along with concerns about ownership and the long-term conservation of the sites. New digital technologies, however, may provide pathways through these restrictions or barriers to travel. These same technologies will provide for a more democratic interpretive process that permits visitors to take away digital 'souvenirs' while encouraging them to leave behind artefacts they create themselves, to share with a growing community of visitors, in the form of digital recorded memory, whether voice, video, photo or text. Hence, tourists become participants in an organic interpretation of the site, who do not merely remain the passive recipient of an official, monolithic narrative. Their user-created content will complement the extant archival information (oral histories, amateur and official film and photography, maps, radio programs and reports) that will be increasingly available to tourists.

Paper Saturday 12 December 12.20 pm – 12.40 pm	Buggering Around in the Backyard: Creating Attachment to Place through Archaeology and Materiality Steve Brown

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Opportunities to participate in or direct excavations can be rare for most Australian archaeologists working in cultural heritage management within government. Besides being a core disciplinary skill area and a method for investigative research, archaeological excavation can provide a stimulating, lively and shared human experience. Prompted by these and other considerations, I have turned to my own backyard to get down and dirty.

The idea for this presentation has two origins. The first lies in the cultural heritage research I undertake for the NSW State government. In part, this work looks at how community attachment to place is managed on public lands reserved for conservation. DECCW's culture and heritage Research Section has spent over a decade studying people's connections to place. The research has caused me to reflect on my own feelings of connectedness to objects, place and landscape.

The beginnings of this deeper reflection, the second point of origin for this presentation, coincided with the purchase of a house in August 2007 in the Sydney suburb of Arncliffe. This reflection was initially motivated by my bower bird-like collection of the material traces of the history of 85 Fairview Street. In undertaking a home renovation, so *de rigueur* in Sydney, and creating a garden, a wealth of historical material traces were recovered. From the house came coins, pins, a betting ticket and prescription medicine bottles, and digging in the garden uncovered artefacts ranging from a late nineteenth century clay pipe bowl to recent plastic toy cars and soldiers. Test excavations in the backyard are proposed.

In this presentation I will explore how the materiality of, and emotional responses to, objects and species play a role in constructing feelings of place attachment. I argue that practicing archaeology and experiencing the material, notwithstanding the excitement generated, can arouse strong senses of belonging and of place attachment. While I focus on my own relationship with the materiality of a special suburban space in this regard, I suggest more broadly that degrees of place attachment are commonly constructed for heritage places by those who practice archaeology.

Poster	Playing God with History? Creating 'Wild Nature' from Living Landscapes Steve Brown

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In Australia today, park management is constructing many protected areas as solely 'natural' landscapes. Peoples' social and spiritual attachments to these landscapes are not being adequately recognised or effectively integrated into management planning and practice. A failure to incorporate social and spiritual values into protected area management is a threat to peoples' continued attachment and belonging to special places. The poster relates to cultural heritage management within Australian protected areas. It considers the challenges for present and future park managers ('New Guard') in the management of cultural values, both material and intangible heritage values.

Paper Saturday 12 December 4.00 p.m. – 4.15 pm	Rio Tinto Coal Australia's Development and Use of Innovative GIS/GPS Technologies and Methodologies as Cultural Heritage Management Tools in the Coal Mining Sector David Cameron

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Rio Tinto Coal Australia has developed a comprehensive cultural heritage management system for its coal mining operations, projects and exploration activities. Rio Tinto has embraced the use of new and innovative GIS/GPS technologies and management methodologies as cultural heritage management tools. Consistent with well developed mining risk management processes, GIS/GPS technologies and methodologies, including integrated mobile GIS/GPS, management zoning and sites data management, have been developed and implemented at Rio Tinto coal sites to help mitigate risks associated with development activities impacting cultural areas and development constraints. Another key focus has been to utilise these technologies and methodologies to identify and develop protective management regimes for cultural landscapes in partnership with our Aboriginal communities. The key to the successful utilisation of these technologies and methodologies has been to draw on external leading practice to develop in-house skills and capabilities to suit Rio Tinto's heritage management ethos and business requirements. This paper will explore why and how innovative GIS/GPS technologies and methodologies have been engaged by Rio Tinto to better understand, assess and mitigate risks associated with managing Aboriginal cultural heritage, to improve the heritage management procedures and to deliver better management outcomes for the company and our Aboriginal communities.

Poster	Investigating Prehistoric Occupation Intensity and Noongar Mobility Patterns in Southwestern Australia

Richard E. Cameron

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This study investigates site occupation intensity, as a combined measure of frequency of site use, group size and occupation duration, which is expected to inform on relative prehistoric hunter-gatherer mobility patterns in southwest Australia during the mid- to late Holocene. The three studied sites are surface scatters located within the Esperance Plains Fitzgerald Biogeographic sub-region on the southern coast of Western Australia and are on the traditional land of the Indigenous Noongar. Reduction intensity within the lithic artefact assemblages recorded at these sites is expected to reflect prehistoric behavioural organisation strategies. The sites are Minarup, several kilometres inland from Dillon Bay, Chillinup, located approximately 50 km inland on the Pallinup River, and Eldon Park, located approximately 100 km inland in the headlands of the Corackerup Creek catchment which joins the Pallinup near Chillinup. These time-transgressive surface scatters are broadly considered part of a contemporaneous land-use system during the mid- to late Holocene as evidenced by the presence of backed artefacts at all three sites. This study aims to fill a void in archaeologically based mobility studies, focusing on the analysis of assemblage variation, in southwest Australia. Previous studies of prehistoric Noongar behavioural patterns in this region by Anderson, Bird, Dortch and Hallam focus on ethnographic data and very coarse-grained assessments of archaeological site patterning based on site size and density, and the presence of site features such as fish traps and grinding material. These previous studies suggest that sites can be broadly classified as ‘congregation’ or ‘dispersal’ sites, and propose that larger congregative sites occur more frequently in the wetland environment within the coastal plains, while inland occupation is more dispersive. The approach developed for this project provides a more fine-grained archaeological analysis following some recent work in Australia spearheaded by Holdaway and expects to support the previous studies in the region. The measures of reduction intensity, such as MNF to core ratio, platform preparation and artefact dimensions, for the three main raw material types, chert, fine grained quartzite and quartz, are compared within each site and across the region. This information is incorporated with environmental and ethnographic data from the region to inform on prehistoric occupation intensity and relative levels of mobility between these sites within different environmental contexts. The results suggest that occupation intensity is greater at Minarup than at the two inland sites, although occupation duration is unlikely to have been considerably longer. This supports the theories developed by previous studies and provides a closer examination of the archaeological record. It is hoped that this method will be developed further by future research locally and elsewhere.

Paper Saturday 12 December 11.40 am – 12.00 noon	Mr Duniam and his Mummy Chris Carter

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Within the collection of the McLeay Museum at the University of Sydney are the preserved remains of an adult female human labelled 'Peruvian Mummy'. Apart from a collection record card dated 5 March 1964, the Museum holds no records to indicate how the mummy came into its possession. However, shipping records of 1851 show that Mr George Duniam brought two mummies into Sydney. Newspaper reports indicate that he had obtained the mummies in Peru and shipped them to Australia via San Francisco. The mummies were the subject of an exhibition at the Royal Hotel in Sydney for several weeks late in 1851. They were later exhibited at the Australian Museum, Hyde Park, Sydney, however by early 1852 they were no longer held there. Museum records do not record how they were disposed of. This paper will describe the mummy at the McLeay Museum, summarise what is known of Mr Duniam and the mummies he brought to Sydney and introduce the cultural context of mummies of southern Peru. The paper will then put forward an argument as to whether the mummy at the McLeay Museum is one of those brought to Australia by Mr Duniam in 1851.

Poster	The Study of Internal Growth Lines on *Anadara granosa* from the Abydos Plain, Coastal Pilbara, WA, Australia

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This study aims to evaluate the potential for the use of internal growth line structures in the common edible bivalve *Anadara granosa* as a regional indicator of past human activities and environmental changes, particularly in the Australian tropical context. Previous research has shown that in modern experimental situations these growth lines may be sensitive to tidal regime and local environmental conditions (Richardson 1987). The samples from salvaged archaeological site contexts near Port Hedland are examined to test whether *A. granosa* shells of late Holocene age also preserve internal growth structures.

Microstructural lines form when the secretion of calcium carbonate takes place during shell growth. The periodicity and thickness of growth increments, which varies between different species, has the potential to provide chronologically high resolution information on past environments. This molluscan sclerochronology has previously been used on archaeological samples to establish seasonality of shell collection, identifying the calendrical information on growth lines to determine the time and age at death (Deith 1983). Other factors which can influence growth incremental patterns include environmental conditions such as nutritional availability, temperature, precipitation and salinity. This analysis adopts and reviews the methodology used by Richardson (1987) for the preparation of acetate peels of *A. granosa*. Samples are cut across the plane of maximum growth, and their sections are replicated on acetate sheets, which are then microscopically examined. It is hoped that this study will provide useful insights in determining the origin of shell middens and the archaeological significance of the site, as well as in reconstructing the local environment in the past.

Deith, M. 1983 Molluscan calendars: the use of growth-line analysis to establish seasonality of shellfish collection at the Mesolithic site of Morton, Fife. *Journal of Archaeological Science* 10:423-440.

Richardson, C.A. 1987 Microgrowth patterns in the shell of the Malaysian cockle *Anadara granosa* (L.) and their use in age determination. *Journal of Experimental Marine Biology and Ecology* 111:77-98.

Paper Sunday 13 December 3.40 pm – 4.00 pm	Emu Butchery and Economic Utility: Implications for Understanding Australian Zooarchaeology and Megafaunal Extinctions

Brett Cochrane[1], Jillian Garvey[2], Chris Boney[1] and Judith Field[2,3]

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Debate continues over the possible role of humans in the Late Pleistocene faunal extinctions and the nature of possible interactions between humans and the megafauna. If megafauna were indeed human prey then it is important to try and understand the economic utility of relevant target prey, and where and how they were taken (see O'Connell 2000). While two Australian studies have attempted to evaluate the economic utility of some macropod species (Garvey in press; Marshall and O'Connell 1989), the data for another important target prey–the emu (*Dromaius novaehollandiae*)–has yet to be compiled. As suggested by O'Connell (2000), understanding modern prey selection, butchery patterns and food sharing in modern contexts may provide important interpretive frameworks for the archaeological record. This paper presents the results of a butchery and economic utility study of emu from the semi-arid zone of southeastern Australia. The results are discussed with consideration of O'Connell's (2000) suggestion that open locations such ephemeral waterholes may have been important prey acquisition foci in semi-arid and arid contexts; and with reference to the Cuddie Springs evidence where the bones of the extinct giant flightless bird *Genyornis newtoni* are found co-occurring with flaked stone artefacts.

Garvey, J. in press Economic anatomy of the Bennett's wallaby (*Macropus rufogriseus*): implications for understanding human hunting strategies in late Pleistocene Tasmania. *Quaternary International*. DOI:10.1016/j.quaint.2009.07.006.

O'Connell, J.F. 2001 An emu hunt. In A. Anderson and T. Murray (eds), *Australian Archaeologist: Collected Papers in Honor of Jim Allen,* pp. 172-181. Canberra: Pandanus Press, The Australian National University.

O'Connell, J.F. and B. Marshall 1989 Analysis of kangaroo body part transport among the Alyawara of Central Australia. *Journal of Archaeological Science* 16:393-405.

Paper Saturday 12 December 4.30 pm – 4.45 pm	SahulTime and TemporalEarth: A Step Towards Digital Earth? Matt Coller

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At the 2007 AAA conference, I introduced SahulTime, a prototype visualisation of ancient Australia, which places the archaeological record into a context of sea-level and landscape change. SahulTime has since been populated with a wide variety of data sets and coordinated visualisations, and now unites timescales from the historical to the geological scale. In bringing together multi-disciplinary knowledge within an intuitive interface, SahulTime also makes an important contribution toward the concept of "Digital Earth" as proposed by Al Gore in 1998. Building on the success of SahulTime, work has begun on a more generally applicable system, TemporalEarth, which aims to address some of the shortfalls of GoogleEarth and KML as a means for displaying spatio-temporal concepts such as time-series data sets, regional chronologies, colonisation theories, and landscape reconstructions.

Poster	Aboriginal Technological Organisation at Kurnell, Botany Bay, New South Wales

Josh Connelly

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Over the past 45 years the Kurnell Peninsula has been the focus of a number of projects carried out by amateur, academic and consultant archaeologists. These surface collections and excavations recovered vast quantities of lithics made from a diverse range of raw materials. This large quantity of cultural material contrasts strongly with the almost complete absence of suitable stone resources at or near Kurnell. This poster explores how Aboriginal people at Kurnell organised their technology and provisioned themselves with enough stone to satisfy their predicted needs.

Paper Monday 14 December 10.10 am – 10.30 am	Stone Arrangements of the Bonaparte Archipelago: Results of an Archaeological Survey of Offshore Islands of the Bonaparte Archipelago, NW Kimberly Coast, Western Australia Darren Cooper and Joe Mattner

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A survey of the seven outer islands, centred on the Maret Islands, in the Bonaparte Archipelago off the NW Kimberley coastline has found a wealth of archaeological material including stone structures and arrangements, engravings, and a minor number of other sites. This paper outlines the results of this survey in an area that is generally inaccessible, and which has had little previous archaeological investigation. The paper will focus on land use and resource usage patterns, and how this fits in with previously established regional views of coastal island land use.

Poster	A Word to the Brave: Some Hints and Tips on the Preparation of a Skeletal Reference Collection

Sarah L. Croker and Denise Donlon

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Generations of archaeologists may change, but some aspects do not. As long as there are people digging in the ground, bones will be found, and will need to be identified. To identify a bone to species level, the quickest way, both now as in the past, is by comparing the bone with a reference collection of specimens of known origin. Yet such reference collections are few and far between. Largely, this scarcity is because the preparation of bone material to a condition that will be suitable for long-term use is a time-consuming, tedious and unpleasant process. We therefore found it necessary to create our own collection of non-human limb bones for use in a larger research project. Fresh bones were prepared using the method of water maceration, this being one of the methods that results in least damage to the bone material. This poster offers some observations to assist others who may be required to prepare bone material for use in a reference collection.

Paper Monday 14 December 9.30 am – 9.50 am	The Pleistocene Archaeological Record at Hope Downs 1, Western Australia Dawn N. Cropper and W. Boone Law	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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ACHM has salvaged 30 rockshelter sites in the Hope Downs 1 Mine, which is located approximately 75 km northwest of Newman, Western Australia. Thus far, our investigations have identified Pleistocene cultural deposits at Djadjiling, Jundaru (formerly known as Malea), and HD07 3A PAD13 rockshelters. These sites contribute to our understanding of the early occupation of the Pilbara and offer a rare glimpse of Aboriginal life during the Late Pleistocene. The evidence collected from these sites demonstrates that the Hamersley Plateau was initially occupied 35,000 years ago, and the region continued to be occupied during the much more climatically harsh period of the Last Glacial Maximum. Based on the flaked stone artefact assemblages from Djadjiling and Jundaru, it is argued that the archaeological signature of human activity is more pronounced during the initial occupational phase between 35,000 and 25,000 years ago than during the hyper-arid phase of Last Glacial Maximum. This paper presents the findings of our analyses completed thus far and discusses the implications of our results for interpreting the Late Pleistocene record of the inland Pilbara.

Paper Saturday 12 December 11.00 am – 11.20 am	Fruits, Nuts and Vegetables: Archaeological Dissonance in Sahul Tim Denham

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There is a saying that owners look like their dogs; something similar might be said of archaeologists and their subject matter. Given I study plant use in Sahul, this may be an admission too far. In this talk, I reflect on the mutual constitution of identities, and tensions therein, in the examination of plant use in Australia and New Guinea. In particular, I highlight the myopia of much archaeological practice on this subject in the region and what this indicates about two sets of identities: those of the archaeologists and those of the subjects they form in their studies - in particular, the application of the constraining concepts of 'farmer/cultivator' and 'hunter-gatherer/forager'.

Paper Monday 14 December 9.50 am – 10.10 am	Using Archaeological Otoliths to Determine Palaeoenvironmental Change and Ngarrindjeri Resource Use in the Coorong, South Australia

Morgan Disspain[1], Lynley A. Wallis[1,2], Bronwyn Gillanders[3] and Ngarrindjeri Heritage Commitee[4]

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Increasing collaborations between archaeologists, marine ecologists and other scientists are developing new methods for recognising and measuring the impacts that Indigenous people had on coastal environments. Otoliths (fish ear bones) can be identified to species level, record the age and growth of a fish from the date of hatch to the time of death, and in combination with trace element analysis, allow the reconstruction of palaeoenvironmental conditions including water temperature and salinity. Otoliths recovered from the archaeological record can provide valuable archives of ecological patterns, climate change and by inference, associated human responses. However, most analyses of archaeological fish remains in Australia have focussed on identifying only the species and sometimes the age of the fish, with more detailed geochemical studies not pursued. In this paper we present results from the analysis of archaeological otoliths from middens along the Coorong, dating from the mid- to late Holocene period. Results demonstrate that the majority of the fish (identified as *Argyrosomus japonicus* and *Acanthopagrus butcheri*) present in the assemblage were caught in freshwater environments during the warm season, in accordance with Ngarrindjeri oral tradition. Most of the harvested fish had reached sexual maturity, determined by total length measurements and estimated ages, indicating that younger fish were avoided so as to ensure conservation of the species. However, despite the implementation of such strategies, human predation had an impact on the population dynamics of *Argyrosomus japonicus*; it is suggested that the species experienced a decrease in fish size and an increase in fish age over time. This study also provides data supporting the argument that people have significantly altered the waterways of the Coorong. Trace element data of otoliths associated with dates from ca 2500 BP to ca 200 BP revealed fluctuating levels of salinity in the estuary that were significantly lower than the hypersaline conditions experienced in some areas today. Ultimately, this project provides a foundation for further development of geochemical analyses of otoliths within archaeological investigations.

Paper Sunday 13 December 10.10 am – 10.30 am	Understanding Past Noongar Land Management: Further Research in the Pallinup Catchment, South-Coastal Western Australia Joe Dortch[1], David Guilfoyle[1,2], Ken Hayward[1,3] , Jane Balme[1], Fiona Dyason[1] and Ellie Rusack[4]

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In our previously reported research in the Pallinup Catchment, south-coastal Western Australia, we hypothesised correlations between environmental seasonality and seasonality of past movements, congregations and land management patterns of Noongar hunter-gatherers. The region's archaeological, ethnographic and historic records suggest that seasonal hydrological changes strongly influenced Noongar seasonal movements. This paper presents recent landscape-scale analyses of artefact distribution and raw material conservation. Raw materials are flaked and used more conservatively and efficiently in locations that are favourable for congregations, and as artefact discard is also more frequent, we infer more sustained and larger occupations at these places. Because of the limited number of perennial water sources, the ripening of many food plants, and the co-operative hunting methods employed for some food animals, congregation rather than dispersal is an attractive option in the dry summer. Landscape burning, the main pre-European land management technique, is also favoured in summer. If our earlier prediction that landscape management centres on congregative sites is correct, then we can infer the locations of the most intensive land management from environmental characteristics and the archaeological record of stone artefact scatters. Further research on palaeo-environments will help test these inferences.

Paper Friday 11 December 3.00 pm – 3.20 pm	Archaeology and Anthropology: An Introduction Neale Draper and Fiona Sutherland	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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All archaeological sites have ethnographic relevance, although not all ethnographic sites have archaeological relevance, for example unmodified natural landscape features related to ancestor creation stories. Furthermore, Traditional Owners attach different meanings and values to sites depending on the cultural context. For example, some archaeological sites in remote areas are often considered by traditional owners to be merely old rubbish dumps, albeit containing the possibility of usable resources. However similar sites in urban areas may have significantly different values to traditional owners, for example, as manifest connections to a cultural past where other connections have been disrupted or weakened. This session will address the interface between archaeology and anthropology, as well as providing a forum for conference participants to explore these issues.

Paper Sunday 13 December 11.00 am – 11.20 am	Assessing the Condition of Heritage Values: A Response to Shifting Implementation of the EPBC Act Laura Farquharson

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Cultural heritage values within Australia's Commonwealth lands are managed under the EPBC Act, and while the Act itself is not new, there is a discernable shift in the way it is being implemented in the management of these values. The Act requires that management plans for Commonwealth Heritage Places 'assess and monitor the condition of heritage values', and while in the past this requirement has not featured heavily in Commonwealth heritage management practices, it is increasingly becoming a requirement of compliance for Heritage Management Plans for Commonwealth Heritage Places. This shift in focus is significant, because while assessing heritage values is well understood in Australia and has been commonly undertaken in the preparation of heritage management plans, the concept of assessing the 'condition' of heritage values in EPBC Act terms is relatively new. In the past, assessing condition has generally been understood to mean the condition of the physical fabric of a heritage place, however the EPBC Act Regulations are based on protecting, conserving and managing 'values' which are both imbued within and extend beyond the physical fabric of a place. In response to this shift, an innovative methodology was developed to enable a 'condition assessment' of heritage values, utilising the terms 'condition' and 'integrity' as key indicators. In this paper, a case study from recent work for the Department of Defence at Jervis Bay is presented, demonstrating how the methodology was successful in responding to the requirements of DEWHR in the evolving implementation of the EPBC Act. It is suggested that this type of condition assessment of heritage values will be a more common requirement for the management of Commonwealth Heritage Places in the future.

Poster	Keeping Country: An Introduction to Aboriginal and Torres Strait Islander Cultural Heritage Management

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One of the great ironies of archaeology in Australia is that so much of the profession deals with Indigenous heritage, yet so few Indigenous Australians participate as qualified heritage professionals. Lack of knowledge about the discipline and access to introductory education materials are recognised problems in this regard, especially for remote and rural communities. *Keeping Country* is an open-access web-based training package developed by archaeologists across The University of Queensland that aims to improve awareness of cultural heritage management (CHM) practice and careers in Indigenous communities and lead to higher Indigenous participation rates in the profession and better management outcomes for Australia's past. Developed with the input of Indigenous communities from Southeast Queensland, the course comprises five assessed units on CHM, drawing on content derived from both UQ's CHM courses and open access documents. Supported by Commonwealth (Higher Education Equity Support Program – HEESP) and industry funds (University of Queensland Culture and Heritage Unit and Everick Heritage Consultants Pty), the course is free to the user, written in plain English, and fully self-contained, with multiple choice assessment and a certificate of completion. With an accompanying evaluation, the course is set for review and revision in 2010.

Paper Sunday 13 December 3.20 pm – 3.40 pm	On Common Sense: Dead Kangaroos, Game Cameras and the Construction of Uniquely Australian Taphonomic Models Melanie Filios

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As archaeologists of the "New Guard" we are tasked with the burden of interpretation. No longer is it sufficient to simply quantify what we unearth, rather we must make greater sense of our material if we are to begin to understand past human behaviour. Nowhere is this need greater than in Australian zooarchaeology. If there is to be a future for Australian zooarchaeology, we need interpretation, and this interpretation can only begin when a body of uniquely Australian data is generated. As a first step toward such a task, this talk begins at the beginning (to steal a phrase from Cole Porter) by addressing the role of ecology and biome in the development of Australian taphonomic faunal models – specifically naturally accumulated assemblages of bone. It presents some preliminary thoughts generated by data gleaned from experimental studies in both the temperate and semi-arid zones of NSW, and asks the following questions: How much does environmental zone or particular species of predator, prey or scavenger really matter to the ultimate composition of a faunal assemblage? Is zooarchaeology just about common sense?

Paper Saturday 12 December 9.10 am – 9.30 am	Blank on the Archaeological Map - Five Decades of Exploration and Discovery in Australia Josephine Flood

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Australian archaeology only really began in the 1950s, pioneered by Mulvaney, McCarthy, Tindale and others. Then in the 1960s the lure of a continent with a largely unknown distant past attracted overseas researchers such as Rhys Jones, who came from Cambridge to investigate 'The Problem of the Tasmanians' - who are Indigenous Tasmanians and where did they come from? Others such as myself switched from classical archaeology or other disciplines to explore the big questions about Australia's deep past. At first we did regional studies, providing extensive fieldwork experience to many students. Gradually many blanks on the archaeological map were filled and everything that we found or didn't find was important and still is.

As Australia's archaeology and rock art were uncovered in the 1970s and 1980s, inspiring public lectures, media coverage, films and books brought each new discovery before an intrigued public. Sadly in the 1990s and 2000s the advent of political correctness and reduced funding led to a slowing of archaeological research into indigenous Australia, which tended to be put into the 'too hard basket'. Although many of the big issues in Australian archaeology remain unsolved, the focus of ARC archaeological grants moved offshore.

Here I suggest ways of regaining the excitement, inspiration and funding of the Golden Age of Australian archaeology.

Paper Friday 11 December 3.40 pm – 4.00 pm	From Moth Hunters to Mungo: Indigenous Insights into Recent and Pre-Historic Archaeology Josephine Flood	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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'Is there archaeology without ethnography?' was the provocative title of the 6th AAA conference in 1983. The answer within Australia was a resounding "No!". The proceedings were published in *Archaeology with Ethnography: An Australian Perspective* (Meehan and Jones 1988), to which I contributed a paper entitled 'No ethnography, no moth hunters'. Even in the 1980s the climate of scepticism was such that, had I been brave enough to suggest a model of moth hunting based on archaeological evidence alone, it would have been rejected.

Now the pendulum has swung (perhaps too far?) to a rejection of the ethnographic approach in favour of 'purism', relying solely on archaeological investigations to reveal human life in ancient Australia. Whilst I acknowledge that at sites like Mungo ethnographic analogies may have been overused in the past by myself and others to interpret the archaeological evidence, I take issue with those who reject as "hazardous" Traditional Owners' insights into the archaeological reconstructions of the distant past. (Specific examples of helpful Aboriginal interpretations are given.)

Paper Sunday 13 December 1.50 pm – 2.10 pm	Special Cases In Near Surface Geophysical Investigation: Examples Of 2D, Quasi-3D, And True-3D Resistivity Imaging For Mapping Archaeological Remains Aaron Fogel

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Much of the archaeological geophysical investigation performed in the world today, utilizes a standard suite of instruments that facilitate the collection of data for large areas. Essentially, the end product of this methodology is a plan map locating subsurface features of interest in a horizontal plane. Without question, this methodology has often provided spectacular results and has proved to be extraordinarily beneficial in the investigation and preservation of archaeological sites. However, not all remains lend themselves to such an approach. For example, deeply stratified deposits such as earthen mounds and tells require an investigative method which can image how features and deposits change vertically, as well as horizontally. In addition, individual anomalies identified through standard geophysical investigation may require high resolution imaging to facilitate their investigation and/or preservation. In these special cases two-dimensional, quasi three-dimensional and true three-dimensional resistivity imaging techniques have been capable of successfully imaging archaeological remains in both historic and prehistoric contexts.

Paper Saturday 12 December 11.40 am – 12.00 noon	Recent Investigations at Karara, Western Australia and Future Directions for a Regional Archaeology

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This paper presents the findings of recent archaeological ground surveys conducted over a mining lease located in the north eastern corner of the wheat belt region of Western Australia. Three years of investigation in the area have revealed a landscape rich in archaeological material, with a total of 48 Aboriginal sites identified and recorded, particularly dense across the Banded Ironstone Formation (BIF) ridgelines. The research potential of this region has been previously unrecognised as much of the area remains unexplored archaeologically, with surveys focusing around mining developments or infrastructure corridors. Furthermore, the northward expansion of the pastoral and farming industries have erased most of the archaeological record from the surrounding areas, much of the remaining sites now being reduced to refugia in the hills (incidentally now being targeted by mining interests). The findings of this survey are compared to sites identified in the similar geomorphological units of Mt Gibson (to the east) and Koolanooka Hills (to the west) and tied to the ethnographic narrative of the area. Currently the datasets have spawned the start of two masters theses, one on a regional analysis of BIF ridgelines as an economic focal point for the exploitation of lithic and food resources, the other one an ethnobotanical analysis of grindstone technology across Western Australia. Future directions for archaeological research are also suggested, including a lithic sourcing analysis based on the X-Ray Fluorescence characterisation of the chert quarries in the area tied to a spatial analysis of isolated artefacts identified across the landscape; the excavation of the archaeological deposits identified in several of the local rockshelters to understand the occupation history of the region; and an Australia-wide comparative analysis of cultural material identified on BIF ridgelines.

Paper Monday 14 December 10.10 am – 10.30 am	Aboriginal Tool Stone of the Central Hamersley Range, Pilbara, Northwestern Australia Richard Fullagar[1], Michael Slack[1], Paul Carr[2], Brian Jones[2] and Penny Williamson[2]	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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Reliable and consistent identification of stones (rocks and minerals) is important for archaeological studies, and the pace of site recording in Pilbara field surveys demands rapid recording of tool stone used for flakes, cores and grinding implements. With isolated artefacts, there may only be one crack at identification, because isolated artefacts are not afforded the protection of sites in WA.

Moreover, the variability of rocks and minerals in this landscape creates potential confusion in the identification of siltstones, chalcedony and chert. A particularly common rock like Banded Ironstone Formation (BIF) has bands of chert, and microscopic studies may be needed to distinguish siltstone from chert or chert from chalcedony. Reliable stone identification may be vital for inferring tool stone sources, and for interpreting why certain flaked tool stone appears more reduced than others. Studies in the Hamersley Range suggest differential selection, reduction and discard of chert, siltstone and ironstone, but are we all talking about the same tool stone?

To address the potential problems, a tool stone reference collection has been established (based at Pilbara Iron offices in Dampier) for use in the field and has proved a useful aid for field crews. We intend to expand this collection with more stones and thin sections from wider areas in the Pilbara, and hope to develop greater consistency in tool stone terminology. We welcome input from colleagues to expand this collection and develop characterisation studies for sourcing.

Paper Sunday 13 December 9.50 am – 10.10 am	Gender, Mobility and Technology: Interpreting Spatial Distributions of Arrow and String Bag Characteristics in the Upper Sepik and Central New Guinea Andrew Fyfe and Jill Bolton

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In a recent study exploring relationships between language and material culture in neighbouring regions of the Upper Sepik Basin, Border Mountains and Central New Guinea highlands initial analysis focussed on distributions of arrow and string bag attributes. The conjoint analysis of these classes was decided because as both were ubiquitously used, made and traded difference in their distributions would enable the identification of patterns beyond those attributable to the effects of geography, ecology, or exchange. Secondly, as they were made exclusive by either men or women it was believed that the distributions could potentially reveal the impact of any difference between the social patterns of men and women. The resulting ANOVA and correspondence analysis for both classes involving metric and categorical frequency data consistently clustered language groups in a manner that generally reflected their geographical positions without any notable contrarian effect attributable to linguistic relatedness. It was concluded that these distributions were mostly a product of recent social interaction rather than one whereby conveyance had been predominantly directed according to a process of inheritance following genetic lines. Importantly, however, geographical position was more strongly defined for string bag attributes and this was argued to reflect the fact that women, by and large, had more restrictive spheres of social interaction than men. This paper describes new analyses involving these data. Similarity matrices were constructed for two samples of individuals each belonging to a particular functional subclass of arrow or string bag. Mantel tests were undertaken to quantify the relationship between these and geographical distance matrices to determine a measure of autocorrelation for each class. Principal coordinates analysis was also performed for these data to visualise relationships between individuals belonging to either class. These analyses showed that arrow individuals were less tightly clustered than string bags, and that arrow variation exhibited more cline-like characteristics, a result in line with the way in which languages were positioned across attribute levels in the earlier CA analysis of the two classes. Aside from reaffirming that arrow technology had been more widely disseminated we argue that these results indicate a difference in interdependency between techniques used to create the components associated with either class. Arrow making techniques are generally more interchangeable meaning that individuals can more easily accommodate alternatives and innovations. Finally, we discuss the implication of these results for archaeology particularly in view of the increasing interest in transmission processes and the role of cultural biases and pedagogy in shaping and maintaining cultural traditions.

Paper Sunday 13 December 2.10 pm – 2.30 pm	The Big Game Hunters? Zooarchaeological Analysis from the Middle Palaeolithic of Longyadong Cave, Luonan Basin, China

Jillian Garvey[1,2], Richard Cosgrove[1], Shejiang Wang[1], Song-mei Hu[3] and Wei Ming[1]

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Subsistence exploitation data from the last 400,000 years apparently reflects two distinct behavioural patterns characteristic of either archaic or modern humans. First there is a notion that hominids of the Middle Palaeolithic were essentially scavengers who rarely hunted large and potentially dangerous herd prey. It implies the opportunistic use of resources gathered on an encounter basis while engaged in other activities. The second notion is that specialised hunting and butchery patterns showing single species predation, food transport, prime-aged prey selection and processing were part of the modern human behavioural repertoire, appearing predominately 50,000 to 35,000 years ago. This behaviour implies planning, forethought, information gathering, co-operation, use of appropriate technology, resource scheduling. Some archaeologists see the distinctions as demonstrating limited planning depth and by implication lacking 'complex' behaviour during the Middle Palaeolithic (Binford 1984, 1985, 1989; Gamble 1992). Others have preferred to view the two modes of subsistence not so much as a dichotomy but more as a continuum, strategies used at appropriate times and places by the same groups of hominids (Stiner 1993:385). Startling evidence of wooden projectile hunting technology at least 400,000 years old further intensifies the debate (Dennell 1997; Thieme 1997). These concepts are central to arguments about the evolutionary position of the Middle and Upper Palaeolithic hominids where organizational complexity is argued to reflect landscape use (Stringer and Gamble 1993:164).

Faunal analysis at the Middle Palaeolithic site of Longyadong Cave, in the Luonan Basin, central China, has revealed a complex pattern of butchery and discard of animal bones by hominid predators. The pattern suggests a focus on a narrow range of prey and systematic butchery. Outside the cave in the open site different patterns were observed. Here we discuss these patterns and the implications they have for the identification of 'modern' human behavioural attributes, and subsequent palaeoecology, approximately 300,000 years ago.

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Paper Sunday 13 December 9.30 am – 9.50 am	It's my Party: Aboriginal Parties in Queensland, ILUAs, the *Aboriginal Cultural Heritage Act* and the Federal Court

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This paper will review the process used to comply with Part 7 of the *Queensland Aboriginal Cultural Heritage Act 2003* (ACHA) in the context of the proposed Traveston Crossing Dam. Specifically, it will explore the complexities that arose for a project that required an ILUA for land access as well as compliance with provisions of Part 7 of the ACHA. The project proponent's creative solution ran at odds to the policy position adopted by the regulator. The case ultimately was resolved through a Federal Court case centring on a judicial review of the ILUA, but confirmed that the project proponent's position. The case throws into stark relief the issues arising from ss34 and 35 of the ACHA in the identification of Aboriginal Parties.

Paper Saturday 12 December 9.50 am – 10.10 am	Reflections of an Old Guard Jack Golson	

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How do I make a selection in terms of excitement and inspiration when there has been so much of it in the discipline itself during my 60 year membership of it, with the enormous methodological and theoretical developments that it has undergone and its extension into new areas, new topics and new concerns? My 60 years came to be spent in contexts where archaeology was of relatively recent arrival, like the settlement history of medieval Europe in which I started, Polynesians in New Zealand and the wider Pacific that followed and, for much the greater length of time, the deep indigenous history of the Australian continent and of New Guinea to its north.

What I have chosen to do is to look at three situations where the excitement and inspiration came from the unifying scholarly role that archaeology could play and from the wide public contribution it could also make.

The examples I shall talk about centre on:
1) New Zealand in the 1950s, focussing on the establishment and early years of the New Zealand Archaeological Association;
2) the 1960s in Australia and the role of the Australian Institute of Aboriginal Studies, as it then was; and
3) Papua New Guinea, before and after independence in 1975, the University of Papua New Guinea and the National Museum.

Paper Monday 14 December 2.30 pm – 2.50 pm	The Brumby and the Bomb: Archaeology at Maralinga

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In the 1950s and 60s, Maralinga and Emu Field in South Australia were the site of a series of nuclear tests, controversial not least because of their effects on the Aboriginal people of the region. Following the period of active testing, Maralinga Village was largely dismantled with buildings, equipment and materials sold and dispersed. The "ground zero" areas were remediated in 1967, and in several phases between 1994 and 2000.

With proposals to develop the tourist potential of Maralinga, the challenge is to represent what is no longer there. The ground zeros are now marked by monuments, and warning signs, the pits of nuclear testing filled in and smoothed over by remediation. However, despite this massive re-landscaping, the ground is still littered with the remnants of test infrastructure. In places, vehicle tracks from the remediation phase survive, overlain by those of more recent visitors. Among the more personal remains are "dinner camps" left from the 1950s survey by Len Beadell, and construction workers into the 1960s. Ephemeral sites such as these have been the focus of a contemporary archaeological approach at other nuclear test landscapes, such as the Nevada Test Site in the US. In this paper, I consider the potential of archaeology to inform the stories that can be told about this brief phase in Australia's Cold War history.

Paper Sunday 13 December 12.00 noon – 12.20 pm	The New *Victorian Aboriginal Heritage Act 2006*: A Registered Aboriginal Party's Perspective Megan Goulding, Darren Griffin and Wurundjeri Elders

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The *Victorian Aboriginal Heritage Act 2006* and associated Aboriginal Heritage Regulations 2007 provide very specific roles for Registered Aboriginal Parties (RAPs). The Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc (the Wurundjeri) was appointed a RAP on 22 August 2008 and therefore has been carrying out its statutory functions for nearly 18 months. This period has allowed the Wurundjeri time to reflect on the strengths and weaknesses of the Act in relation to the work of Heritage Advisors (consultant archaeologists) and Sponsors (the developers), but especially in relation to the ways in which the Act impacts on the cultural heritage it is designed to protect.

Paper Sunday 13 December 9.50 am – 10.10 am	A Town Planner's View on Queensland's Cultural Heritage Legislation

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South-East Queensland is one of the biggest growth areas in the whole of Australia, yet there are no proper processes in town planning to afford protection or even assessment of Aboriginal Cultural Heritage sites for most developments. The lack of proper government processes and a reactive, not proactive cultural heritage legislative framework has resulted in very little protection for Queensland's Indigenous cultural heritage. The Sunshine Coast in particular is a black hole for Aboriginal cultural heritage assessments and protection. A divided and dislocated Aboriginal community, lack of knowledge within the wider community and a general view that cultural heritage is in the too hard basket has led to Aboriginal sites being ignored and destroyed. In this paper I discuss research (field and literature review) undertaken with local Aboriginal people on the Sunshine Coast. We created a database of 477 sites and mapped all of the areas. The mapping was for planners to use as a tool when assessing development applications. However, due to the current legislation, local Aboriginal people still have little to no say on what happens to their cultural heritage. The current legislation is triggered when the ground is disturbed and not in the planning stages of developments; this has bred a culture of ignorance and destruction as there is no one on the ground enforcing the legislation. Many of the documented sites on the Sunshine Coast have been either destroyed or damaged and still continue to be. Is there a way forward? Avenues such as community awareness building, land for culture initiative and planning scheme protection will be discussed.

Paper Friday 11 December 9.30 am – 9.50 am	A New Generation of Archaeological and Geological Research in the Willandra Lakes World Heritage Area: An Introduction to the ARC-Linkage Project, the Environmental Evolution of the Willandra Lakes World Heritage Area

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After nearly 20 years of scientific neglect, the Elders of the Willandra Lakes World Heritage Area (WLWHA) requested a new systematic research initiative that would help to realize the unique value of the area for Australian heritage. The outcome was an ARC Linkage Grant, which is a collaborative endeavor involving the Elders from the WLWHA, the NSW Department of Environment and Climate Change and a team of researchers from The Australian National University, La Trobe University and Bond University. Fieldwork commenced in 2007 with the ambitious goals of documenting the evolution of the Willandra landscape and its environmental history, investigating the history of human settlement, and laying a foundation for long-term research. Work to date has focused on two lake systems, Mungo and Mulurulu. Fundamental to these broad goals was the aim of assessing the impact of ongoing erosion on the cultural remains contained within the lunettes. The results of an initial round of fieldwork include:

- the establishment of a three-dimensional recording system, tied into the Australian Mapping Grid, for Lakes Mulurulu and Mungo, enabling precise correlation of archaeological finds, geological sections and dating samples;
- a stratigraphic and environmental framework for Lake Mulurulu;
- detailed archaeological and geological investigations of three blowouts on the Mungo lunette, providing an understanding of the processes that shape the surface archaeological record;
- the design and implementation of a survey strategy for locating and documenting cultural features in the Mungo lunette;
- the development of techniques for generating high-resolution environmental information from otoliths (fish ear bones) and wombat teeth; and
- training and employment for two Cultural Heritage Officers.

Poster	Training the Archaeologists of the Future

Keith Hall[1], Annabelle Davis[2] and Luke Lowery[2]

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Throughout 2009 Rio Tinto have worked with Nyiyaparli representatives to develop archaeological survey and artefact recording skills for Traditional Owners articipating on heritage surveys. The Rio Tinto Archaeological Assistants Course is a practical archaeology course that teaches skills in survey methods, GPS and compass use, map-reading skills, site recording methods, artefact identification and recording.

Poster	'Dead Men Do Speak': The Collection, Display and Interpretation of Heads within Western Museums

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Head collecting and display was a common practice by museums during the nineteenth and early to mid-twentieth centuries. Different people collected heads for a variety of reasons, and the methods by which they were obtained are numerous, including trade and exchange, theft, purchase or grave-robbing. However, shifts in recent decades in museum practices, relating to increased cultural sensitivity to Indigenous groups, has meant that such items are now rarely displayed. Nevertheless, while museums have largely removed heads relating to the Indigenous people of Australia, New Zealand and the United States, many museums continue to retain and display large numbers of heads from other Indigenous cultures. Here the collection, display and interpretation of these heads within western museums is explored.

This research adds to the body of knowledge concerning the collection of human heads for western museums, and highlights the differences in collection and display practice, in regards to human heads, between western and non-western institutions. Overall, important questions are raised regarding the validity of the retainment and display of another culture's ancestors, in the form of heads, collected during periods of immense cultural and social upheaval. It also raises the question as to whether the cultures represented by heads in western museums, are comfortable with the public display and interpretation of their cultural remains, or whether they are less empowered to request their removal and/or return. This study contributes significantly to addressing these issues and raising awareness of the large scale removal of the World's Indigenous material culture to western museums, and the lack of control many communities continue to have over their ancestral remains.

Paper Monday 14 December 1.50 pm – 2.10 pm	Negotiating the Ngarrindjeri Heritage Program and Closing the Gap Steve Hemming[1], Daryle Rigney[2] and the Ngarrindjeri Regional Authority

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What kinds of partnerships are forming between Indigenous nations, universities, business, heritage consultants and governments in the contemporary context? In asking this question we will focus on the relationship between cultural heritage management (CHM), regional governance and economic development. We are interested in the ways that CHM can be a positive factor in closing the gap between Indigenous and non-Indigenous socio-economic indicators. The Ngarrindjeri Regional Authority's developing Caring for Country and Economic Development programs provide a case study in the complexities of engagements between research, economic development, community governance and wellbeing. We argue that regional Indigenous cultural heritage programs are important to Indigenous futures that incorporate tradition, connection to country, community wellbeing and sustainable local economies. Employment, education and health need to be important elements in these programs.

Paper Saturday 12 December 2.45 pm – 3.00 pm	Exploring the Inaccessible: A Case Study using Google Earth Karen Henderson

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More and more, archaeologists are utilising this tool to carry out 'desktop archaeology' and explore regions and sites that have been previously out of their reach. This paper will use a case study from the Harrat Harra (Basalt Desert) in northern Jordan to demonstrate the vast amount of information that can be gleaned from the 'photomap' of Google Earth, the advantages compared to other remote sensing techniques and discuss the possible application to larger projects.

Paper Saturday 12 December 11.40 pm – 12.00 noon	Using Archaeomagnetism to Identify Heat Treatment and Sourcing of Silcrete Stone Tools: Results from Experimental Studies and the Middle Stone Age of South Africa Andy I.R. Herries[1], Kyle Brown[2], David Braun[2], Erich Fisher[3], Zenobia Jacobs[4], Curtis Marean[5] and Chantal Tribolo[6]

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Archaeomagnetic studies related to fire can be divided into mineralogical studies which identify the mineralogical transformation of sediments and rocks by heat and palaeomagnetic studies that look at alteration of the fossil direction and intensity of magnetisation stored in rocks and sediments. By stepwise thermal demagnetisation it is possible to identify the primary component of magnetisation produced when the rock was formed and isolate it from any secondary magnetisations formed when the rock was heated, as would be the case when humans heat treat rocks for stone tool manufacture. It is also possible to identify the maximum temperature that the rock has experienced during heat treatment. Archaeomagnetic analysis was combined with luminescence, gloss and hardness tests to establish if silcrete stone tools from the Middle Stone Age site of Pinnacle Point 5-6 in South Africa had been heat treated. This was also combined with a mineral magnetic analysis of the deposits from which the material was recovered to establish if the sediments had been heated, and so if the stone tools come from a context where they would have been accidentally burnt. When heating of rocks and sediments occurs weak magnetic mineral phases are transformed to stronger mineral phases. An analysis of experimentally burnt silcrete was also undertaken. Experimental work showed that the best results come from heat treating silcrete to between 300 and 400^{o}C. All archaeological samples from PP5-6 indicate that they have been heat treated, with the majority having maximum estimated temperatures of heating between this temperature range. This archaeomagnetic analysis indicates that early humans were deliberately heat treating silcrete at PP5-6 by 72 Ka, while gloss analysis on a more extensive collection indicates heat treatment as old as 86 Ka at PP5-6 and also perhaps as old as 164 Ka at PP13B. This has major implications for archaeological silcrete assemblages younger than these dates as sourcing of silcrete could be potentially difficult, if not impossible, if the presence of heat treatment has not been established first.

Poster	Maludong: New Research at a Modern Human Site in Yunnan Province, Southern China

Andy I.R. Herries[1], Darren Curnoe[2], Ji Xueping[3] and Paul Taçon[4]

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Maludong (Horse-like Deer Cave) was discovered by quarrying in 1989 and a rescue excavation occurred soon afterwards. During this excavation several thousand faunal specimens were recovered along with some hominoid material and human remains, including two partial calvarii as well a hemi-mandible and post-crania. While the context of the human remains, although not their age, was known, the context of much of the faunal material has been lost, a large proportion of which was never studied after excavation. Recent work was undertaken to recover additional fossil material as well as material for dating and environmental analysis. All material was plotted using a total station, which was also used to create a multi-dimensional map of the cave. This research has so far identified several more human remains from the unstudied 1989 excavation finds as well as additional hominoid specimens some of which have undergone anthropogenic alteration, including burning. While the material falls within the range for modern human variation, the individuals show some archaic features and are robust. Some antler tools, but few stone tools have been recovered. Both extant and extinct deer species have been recovered, the larger extinct forms (Late Pleistocene) come from the base of the sequence and are associated with the human remains, while the smaller extant forms come from the upper Holocene layers. Additional work has also been undertaken on rock art in the Province.

Paper Friday 11 December 4.00 pm – 4.20 pm	Past and Present: Art of the Canning Stock Route Samantha Higgs	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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The Canning Stock Route is a 1781 km track through the deserts of Western Australia. Created in 1906 for drovers to move their cattle from north to south it is now popular as a recreational 4wd route. The Indigenous inhabitants of the country the stock route passes through maintained a traditional lifestyle into the 20th century with some individuals living nomadically, unaware of European society until the 1960s. In 2007 members of the Indigenous Martu community started producing acrylic paintings for sale to tourists and the fine art market. Graphic elements such as arcs and concentric circles are common to both the rock art adorning boulders and caves along the stock route and to the contemporary acrylic paintings, and both are seen as mnemonics for stories of country and the Dreamtime. How does this new art tradition relate to the old? By comparing the rock art with the contemporary art, using ethnography and formal archaeological methods to study the evolution in motif and story form, a greater understanding of the rock art and its meaning may be reached. There are strong reasons why ethnographic archaeologists like myself and most Indigenous Australians see Aboriginal society as the oldest continuous culture in the world and emphasize long-lived tradition, without denying that their society has always been dynamic with significant changes from the deep past to historic times. In my view there was both continuity and change and traditional owners have much to contribute to our understanding of both recent and ancient archaeological sites.

Paper Saturday 12 December 11.00 am – 11.20 am	The Nature and Distribution of Stone Artefacts in Northwest Victoria

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The central Murray Valley is a long, narrow strip of micro-environments that are associated with the present and past Murray River channels, lakes and land systems. The central Murray Valley has been characterised as being poor in stone resources. This lack of a stone artefact record has inhibited archaeological interpretation of Aboriginal behaviour in what has been described as one of Australia's densest populated zones at the time of contact. The central Murray Valley cuts through the vast semi-arid Mallee zone. The Murray River is the only permanent water source within this zone in northwest Victoria.

A model of dichotomous Aboriginal settlement in the Victorian Mallee was proposed over 25 years ago that utilised stone artefact analysis as a foundation. This model distinguishes occupation modes of the northern and southern Mallee by tool typology dating of surface scatters. Stone artefact assemblages associated with the 'Australian Small Tool Tradition' were predominantly found in the southern Mallee. Tool types morphologically similar to the amorphous 'Australian Core Tool and Scraper Tradition' were said to be limited in distribution to the northern Mallee. This model of Aboriginal occupation of the Mallee has virtually remained unchallenged; although a handful of authors have presented evidence to the contrary.

The significant discovery of a silcrete quarry in northwest Victoria during the 1990s provided sufficient data to challenge the model. Subsequent research at the quarry and surrounding areas has added to the knowledge of stone resources in the central Murray Valley and northern Mallee and facilitated in refining the Mallee settlement model. In this paper the model is reviewed in light of the new data available from archaeological studies within the Mallee, the central Murray Valley and from recent consulting work undertaken by the author in the Hattah – Kulkyne National Park. Stone artefact distribution, including raw material sourcing, technological types and typology is examined to provide discussion for a revised model for Mallee occupation in northwest Victoria.

Poster	New Guard Archaeologists ♥ FB Louise Holt and Kylie Lower

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The practice and material culture of archaeology has significantly changed through the last 50 years. From typewriters, paper filled filing cabinets and hand written communication, we flash forwarded to pc's, external hard drives, on-line chat forums, GPS navigation and GIS data analysis. Having been raised in this period of rapid technological change, new guard archaeologists wield these tools with ease, but, it is understood that gadgets can not replace knowledge and skill nor the theoretical and practical base developed by our forbears.

Utilising a popular social networking tool this poster will explore the future of Australian archaeology through the eyes of recent Flinders University graduates, posing questions as a 'status update':

- How do you see yourself contributing to the practice of Australian archaeology?
- How would you like to see Australian archaeology develop in the future?

These ''New Guard" responses will be presented in a 'Facebook style' poster, allowing the viewer to see first-hand how Flinders graduates foresee their contribution to Australian archaeology.

Poster	Application of Portable X-Ray Fluorescence to *in situ* Analysis of Rock Art: Experiments in Spatial Geochemical Modelling Jillian Huntley, June Ross and Peter Grave

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Geochemical analysis of rock art has historically been constrained by the need for destructive sampling and destructive or composition altering analytic techniques. This poster outlines the results of experiments for wholly non destructive *in situ* elemental analysis of rock art. Recent technological advances in field portable instrumentation are allowing us to develop "new guard" methods, free from the complex ethical considerations involved in destructive analysis which have until now largely prohibited systematic archaeometric investigations. The experimental results presented here indicate this new methodology (using Bruker PXRF hardware and software) offers substantial advantages over "old guard" techniques. The *in situ* application of this method will enable future research to address broader and more sophisticated questions without damaging this fragile and unique aspect of our cultural heritage.

Paper Friday 11 December 2.10 pm – 2.30 pm	Tur-rat, Kunpali and Pirlatya: Hare Wallabies, Fish and Mussels. Recent Investigations Concerning the Archaeology of Food, Willandra Lakes Region Harvey Johnston

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The archaeofauna of the Willandra Lakes has occasionally been subject to detailed study since the initial scientific discoveries at Mungo 40 years ago, though far greater emphasis has been placed on understanding the regions environmental history and the physical anthropology of the Aboriginal people that inhabited the region in the Pleistocene. The calcareous sediments and depositional landforms that surround the Willandra Lakes have provided excellent conditions for the preservation of fauna and archaeofauna, much of which dates to the long lacustrine or "lake full" phase before the LGM, or the briefer lacustrine phase following the LGM. The list of fauna present in natural and archaeological contexts in these time frames is extensive, ranging from a small number of megafauna specimens to numerous macropods, birds, reptiles and lacustrine species. This paper discusses the potential for expanding our understanding of Pleistocene palaeodiet, subsistence and economy through an examination of archaeofauna. In particular this paper asks why, in a region that contained such a diverse fauna, there is a concentration of just a few species such as hare wallabies, fish and mussel in the Pleistocene archaeological record of the Willandra Lakes.

Paper Sunday 13 December 1.30 pm – 1.50 pm	Ground Stone Tools from Shangshan Site, South China: Integrating Microresidue and Use-Wear Studies in the Reconstruction of Early Holocene Chinese Subsistence Practices Duncan Jones

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Excavations at the site of Shangshan, Zhejiang Province, have produced abundant ground stone tools whose function has been postulated as potentially either or both cereal and nut processing activities. A combined microresidue and use-wear study has been employed to ascertain the function of these tools in regards to plant exploitation 10,000 years ago in south-eastern China. The way in which the complimentary methodologies of starch, phytolith and micro-wear analysis can be used to create strong evidentiary bases for tool use and larger subsistence practices will also be discussed.

Paper Friday 11 December 9.50 am – 10.10 am	A Preliminary Chronological Framework for the Lake Mulurulu Lunette Tegan E. Kelly[1*], Rainer Grün[1], Ian Moffat[1], Kathryn E. Fitzsimmons[1], Daryl Pappin[2] and Cally Doyle[2]

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The Willandra Lakes World Heritage Area contains a rich and detailed palaeoenvironmental and archaeological record of arid and semi-arid Pleistocene Australia. Lake Mungo, the resting place of Australia's oldest dated Aboriginal remains, has been the focus of investigations in the region to date. Lake Mulurulu, the northern-most lake in the system, contains a similarly abundant record, which remains largely unstudied. Previous interpretations of the lunette chronology have been based on a handful of radiocarbon dates and stratigraphic correlations with dated units at Lake Mungo. Part of the aim of the current study is to address this deficiency in data through the implementation of a robust dating regime canvassing the Mulurulu lunette laterally as well as vertically, utilising a combination of optically stimulated luminescence, electron spin resonance and radiocarbon dating techniques. Preliminary results are presented here. These results form part of a PhD study reconstructing the landscape evolution and palaeoenvironment of the Lake Mulurulu lunette. The geochronology will be combined with a broad environmental framework afforded by sedimentary analysis and a high resolution isotopic record. Results will be interpreted alongside similar studies at Lake Mungo, to document palaeoclimate in the Willandra Lakes more thoroughly and accurately than has previously been attempted.

Paper Friday 11 December 1.50 pm – 2.10 pm	The Study of Faunal Assemblages from Open Sites in the Willandra Lakes: A Case Study from Locality 969660

Marnie Kibble

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Faunal assemblages exposed on the surface of the Mungo lunette may contain the bones of modern animals a well as the bones of Pleistocene fauna that originated from different stratigraphic units, resulting in a pessimistic view of their information potential. Here I introduce five bone scatters at Locality 969660 on the Mungo lunette that were described and mapped in 2007 and again in 2008. The study of these bones scatters enabled me to develop criteria for distinguishing bones making up the modern death assemblage from the Pleistocene assemblage and for distinguishing Pleistocene bones representing traces of people's activities from the contemporaneous landscape death assemblage. The re-recording of these bone scatters after a 12 month interval provides a basis for assessing the short-term impact of erosion and the potential for recovering information through systematic monitoring.

Paper Friday 11 December 1.30 pm – 1.50 pm	Notched Artefacts from the Willandra Lakes World Heritage Area Rebekah Kurpiel

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More than 20 years ago, Dibble and colleagues established that many of the Middle Palaeolithic scraper types defined by Bordes and Bourgnon during the 1950s, actually represent different stages in the resharpening of blunted tool edges, rather than tools produced to a set of design specifications. More recently, Hiscock and Attenbrow have argued that the process of tool manufacture and resharpening produces a continuous array of artefact morphologies, rather than a discrete series of types. However, there has been some debate about whether notched artefacts were tools made to certain design specifications and therefore exhibit a similar, though not identical series of transformations through the resharpening process. This paper reports the results of a preliminary study of notched and other scrapers recovered from Willandra Lakes World Heritage Area by Harry Allen between 1969 and 1972, designed to establish their similarities and differences.

Paper Monday 14 December 11.00 am – 11.20 am	Behavioural Modernity in Sahul's Pleistocene Archaeological Record: Taphonomy, Archaeological Sampling and Previous Hypotheses Michelle Langley

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Sahul, the combined landmass of Australia and New Guinea, provides a record of behavioural modernity extending over at least the last 50,000 years. Colonised solely by anatomically and behaviourally modern humans, this continent provides an alternative record in the investigation of behavioural modernity to the extensively studied Middle Stone Age African and Upper Palaeolithic Eurasian archaeological records. In the past, the archaeological record of behavioural modernity in Sahul has been described as simple, sparse and essentially different to those records of Africa and Eurasia. These differences have been attributed to either low population densities during the Pleistocene or the loss of behavioural 'traits' on the journey from Africa to Sahul. While a number of studies have been undertaken, no single researcher has attempted to investigate the role of taphonomy and sampling on the representation of behavioural modernity in the archaeological record, despite Sahul being characterised by extreme environments, highly variable climates, and archaeologically, usually only small excavations.

This study compiles the most complete record of chronology, evidence for behavioural modernity and excavation details for 223 Pleistocene sites yet attempted. It is also the most extensive dataset assembled for the examination of the issue of behavioural modernity on a single landmass. Site spatial and temporal distribution, site characteristics, excavations, absolute dating, preservation and sample size are examined to determine how the behavioural complexity of a modern human population is characterised on this isolated southern continent and the impact of taphonomy and archaeological sampling on that representation.

Results demonstrate that preservation and sampling play a significant role in structuring the spatial and temporal representation of behavioural modernity in the archaeological record of Pleistocene Sahul. Contrary to previous findings, the evidence for behavioural modernity in Sahul is found to resemble the archaeological records of the African Middle Stone Age and Eurasian Upper Palaeolithic in terms of behaviour and artefact diversity. In terms of global narratives, these results also indicate that current understandings of behavioural modernity are incomplete and may misrepresent levels of behavioural complexity in early periods in some regions.

Paper Monday 14 December 9.50 am – 10.10 am	The Holocene Archaeological Record at Hope Downs 1, Western Australia W. Boone Law and Dawn N. Cropper	

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Rockshelter excavations at the Hope Downs 1 Mine have recorded one of the most comprehensive Holocene archaeological sequences yet documented for the inland Pilbara. Thus far, ACHM's investigations have recovered evidence that extends the known antiquity of backed artefacts technology in the region, and we have identified well-preserved hearth features that provide insight into day-to-day subsistence activities. Our research has also yielded information on site formation processes, which has implications from the assessing the preservation potential of local rockshelter sites. The following paper highlights our research into the past 10,000 years of the Hamersley Plateau's Aboriginal past and discusses our changing perceptions of the local archaeological record.

Public Lecture Sunday 13 December 7. 00 pm – 9.00 pm	Time of Trouble, Time of Change: AD 1250-1350 in the American Southwest Bill Lipe

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In the early AD 1200s, Pueblo Indian farmers numbering in the tens of thousands occupied the northern part of the American Southwest, as their ancestors had done for many centuries. By the 1280s, all were gone, many through migrations out of the area, some through early deaths. What happened? This classic question in American archaeology is discussed in light of new evidence regarding warfare, climate change, and the attractions of growing communities located to the south and southeast.

Paper Sunday 13 December 11.00 am – 11.20 am	The Movement of People from Borneo to Madagascar - Was There Contact in the Maldives? Mirani Litster

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The movement of Austronesian speaking people through the Pacific has been well examined within a multidisciplinary framework; however, whether or not the same movement across the Indian Ocean occurred has not been well documented. It has become conventionally accepted that Austronesian speakers from South Kalimantan in Borneo reached Madagascar, but the question as to how they moved over this vast expanse remains unknown. There are however lines of evidence that suggest more likely routes, including potential contact in the Maldives. These theories and ideas will be discussed in this paper.

Paper Sunday 13 December 2.30 pm -2.50 pm	Diet and Health Status at Chinikiha, Chiapas, Mexico: Some Preliminary Results

Coral Montero López[1], Luis Fernando Núnez[2] , Pedro Morales[3], Edith Cienfuegos[3] and Francisco Otero[3]

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This paper will discuss the results of isotope analyses (C_{13}, N_{15}, and O_{18}) from eight human burials and ten faunal remains from Chinikihá Chiapas, in Mexico. The human remains were found inside a domestic area thus, this data provides valuable information on the health state of these burials, including the presence/absence of dental calculus and attrition, as well as antemortem dental loss, periapical abscesses, caries, and hypoplasias. The presence of these markers in addition to postcranial ones is then used to profile the general health status and dietary intake of the site's inhabitants during the Late Classic period. These results are compared to data from other Mayan sites from the same chronological period.

On the other hand, the results from the archaeofaunal remains from a discard context behind the palace at Chinikihá, allow us to characterize the meat consumption patterns of the elite. When this information is used in conjunction with the zooarchaeological and paleobotanical analyses, it is possible to explore the differential access to natural resources during the Late Classic period. Other topics that are considered include the exploitation and preparation of the faunal resources and the regional exchange of goods, the ritual and domestic use of specific species, such as the white-tailed deer (*Odocoileus virginianus*), which has been identified as an exclusive item of the elite.

Paper Sunday 13 December 2.10 pm – 2.30 pm	Geophysical Anomaly Testing with Down-Hole Magnetic Susceptibility

Kelsey Lowe

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Over the past few decades, archaeogeophysical instrumentation, field methodologies, and data processing have improved dramatically in archaeological prospection. However, it is still difficult to provide an accurate assessment of many anomalies from standard archaeogeophysical datasets. In response to this problem, a new field technique was developed to aid in the interpretation of these enigmatic anomalies. Down-hole magnetic susceptibility field tests were conducted at Parchman Place Mounds (22CO511) located in the Yazoo Basin of Northwest Mississippi. These tests combined a standard coring regime combined with down-hole magnetic susceptibility testing and magnetic lab testing that enriched the archaeological understanding of the site. Tests were conducted on geophysical anomalies and from information gained through excavation creating a symbiotic integration of standard archaeological methods and developing archaeological techniques.

Paper Monday 14 December 8.50 – 9.10 pm	Issues of Archaeological Significance Assessment in the Eastern Pilbara: Some Preliminary Thoughts Alex Mackay[1], Alistair Grinbergs[2], Phillip Hughes[1], Marjorie Sullivan[1] and Doug Williams[2]	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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Assessments of the archaeological significance of sites, objects and locations provide important guidance both with respect to WA heritage legislation and to the prioritisation of archaeological salvage work. Yet significance assessments are complicated by unclear assessment criteria, and by subjective and variable applications of those criteria. In this paper we consider several trial systems for standardising significance assessments in our recent work in the eastern Pilbara. The successes and failures of these systems serve to highlight both some possible ways forward, but also some of the inherent problems with the present concept of archaeological significance.

Paper Sunday 13 December 9.30 am – 9.50 am	Upping the Ante: The Logistics of Bringing a Large-Scale Archaeological Excavation in Line with the Health and Safety Systems of the Mining Industry

Elspeth MacKenzie

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Archaeology on mine sites has a long history, however the fundamentally different nature of the work to typical mining activities, the fact that most archaeological work is carried out on the periphery of mining operations, and that cultural heritage is usually managed by a consultant external to the mining business has meant that archaeologists working on mine sites often work alongside rather than within the standard health and safety management systems. In the Hunter Valley NSW during 2008, Rio Tinto Coal Australia successfully challenged this perceived dichotomy by running the large-scale and complex Warkworth Sands Excavation Project completely within the operating mine's integrated management systems. This paper discusses the challenges involved and the benefits discovered during the process.

Paper Saturday 12 December 3.15 pm – 3.30 pm	Cultural Site Management Systems: Technology for Recording and Managing Archaeological Sites of the Mining Industry Troy Mallie

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Various aspects of GIS, web and relational database technology are being used together to develop and implement Cultural Site Recording and Management Systems (CSMS) for Traditional owner groups, Archaeology consultants and government agencies throughout Australia and overseas. These systems are designed to conform to local cultural and business protocols and allow archaeologists and traditional owners to record photos, GPS locations site maintenance schedules and other content that describe the characteristics and management requirements of archaeological sites.

Data summaries and reports generated from these systems are being used to pre-empt field based activities and to influence management and planning decisions. These tools have also proven to be aid communication allowing these groups to publish selected materials to third parties such as mining companies, government departments and research institutes. Hand held computing technologies are also being used to streamline the process of collating and transferring data collected in the field to these systems.

Paper Sunday 13 December 4.00 pm – 4.20 pm	Mounds – A Palaeoecological 'Treasure-Chest' Sarah Martin

The NSW Riverine Plain is characterised by mounded cultural deposits, regionally known as 'mounds', 'earth mounds' or 'oven mounds', and these are archives of palaeoecological information. Excavations of two large mounds on the Hay Plain provide tangible evidence of past environments, what foods were being cooked, and the cooking processes. The excavations provide support for the ethnohistorically observed focus on wetland plant foods such as *Typha, Triglochin* and *Bolboschoenus*. The use of these plants is strongly suggested by the macroscopic charcoal, imprints on baked clay casts, and pollen. The consistent but minor amounts of wetland faunal bone and shell also suggests that wetlands were the focus, but that the major food resources were probably wetland plants that left little evidence. The excavations also provide actual evidence of mounds being constructed from the remains of baked clay heat retainer ovens; in addition the carbonised, calcined and fragmented faunal bone provides evidence of repetitive use of hot ovens in the mounds. The excavation data bridges the 4,300 year time gap between the bottom of the mounds and the ethnohistorical observations linking women to specialised knowledge of wetland management, and plant harvesting, preparation, and co-operative cooking in ovens on mounds. The spatial patterning of mounds around specific types of current and former wetlands also provides evidence of focus on wetland environments that sustain dense stands of carbohydrate rich plants.

Paper Saturday 12 December 4.15 pm – 4.30 pm	Old Dog, New Tricks: Using GIS in Cultural Heritage Management Jo McDonald

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This paper describes how mobile GIS can assist archaeologists to improve their data collection, interpretation and deliverables for the purposes of cultural heritage management. The Deep Gorge heritage inventory survey aimed at recording all archaeological features within a 2 km x 200 m wide transect on the Burrup Peninsula (Murujuga). Hand-held PDAs were used by several teams to record all site types and to complete saturation recording of petroglyphs. By comparison, the Canning Stock Route Project is recording rock art and dreaming sites in a 1,700 km linear transect through the Western Desert. Both Projects require the collection of information for management purposes, but there are obvious logistical differences which make the collection of standardized information quite different. While archaeologists need to use best practice to provide appropriate advice to their clients [in this case a government department (the former) and various Aboriginal communities plus the ARC (the latter)] ArcGIS provides the tools to facilitate the collection of large quantities of data from both vast and small-scale landscapes.

Paper Friday 11 December 5.00 pm – 5.20 pm	Could Stanner have Wagered his Hat? Did Yao Ancestors (1966-69) Maintain Inherited Rockeries for Poppy Production on Little Elephant's Peak in Northern Thailand? Douglas Miles	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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Opium production by Pulangka farmers during my residence in the village entailed a strikingly different schedule from the cereals. By 1966-68 poppy growers had used the same fields for many decades since their forebears first farmed in the area but in such short fallowing cycles that the trees which seeded or coppiced on the clearings never attained sufficient maturity to form jungle canopies. By the time of my fieldwork the preparation of none of the poppy farms under crop had required further removal of the limestone fragments and pebbles which are conspicuous on the soil's surface in Images 4 and 5. Previous generations had coped with the rubble in two ways which continued to benefit their descendants: (a) by heaping rock into cairns (some of which were of spectacular dimensions) towards the middle of the farm where they have served subsequent generations as useful support structures on which cultivated vines such as beans, cucumbers, chokos, marrows and pumpkins have thrived; also (b) by building waist-high dry stone walls along the perimeters where during fallow, they functioned to corral grazing ponies and if athwart the slope like the logs, to reduce soil slippage and erosion during heavy rain. (They were quite similar to dry-stone fences I have seen on rural properties throughout the scenic Cotswalds, UK.) The result over many years was a barely perceptible but certainly recognisable approximation to terracing which enhanced the worth of a prepared field in deals among the Pulangka Yao.

The accumulated labour which predecessors had invested in coping with the stone problem was surely a deterrent against frequent moves to other sites where the Yao calculated that work at reducing surface rubble would have to begin again and literally from scratch (which is an accidental pun in my words but not theirs). But I seriously question in retrospect whether the term "shifting" cultivation is appropriate for poppy farming as practised for more than sixty years in this particular area.

But the greatest advantages of the pebbles are that they restrict grass growth as they obviously restricted weed growth in competition with poppies which according to older Yao the stones provided with both support during the early phases of growth by these excessively delicate plants and with protection from the winds to which the clearings are otherwise so exposed. The same Yao have now convinced me that contrary to any prediction such work by the ancestors in distributing the stone and thereby limiting vegetation has left a valuable heritage not only for those who will now make campsites on those sites but also for the promoters of these rapidly drying self draining and relatively weed- free slopes as launching pads for paragliding. They are ideal for that purpose especially if they slope at a gentle angle towards a sheer drop which many typically do because of the orientations which poppy growing favoured. Clearly, the Yao of previous generations did not regard limestone only as a massive impediment which had to be shifted in great quantity for the purpose to uncovering the soil beneath.

Paper Sunday 13 December 1.30 pm – 1.50 pm	Magnetism and Prehistory in Australia: Possibilities and Problems Ian Moffat[1,2], Lynley A. Wallis[3,2], Ben Keys[2], Rob Koch[4], Mark Hounslow[5], Alice Beale[6], Kate Domett[7] and Louise Holt[2]

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Magnetic techniques have been recognised as a central component of archaeological geophysics since the birth of this discipline. These methods can provide a proxy record of occupation through the enhancement of the magnetic intensity and susceptibility of soil and sediment resulting from anthropogenic burning, the introduction of organics or the presence of ochre. This paper highlights opportunities for more frequent application of these techniques in Australia by reviewing the results of multi-technique investigations conducted at a series of Indigenous sites in Queensland and South Australia. The results suggest that the degree of success of this method in a field setting is contingent on the local geology, the survey methodology employed and the quality of the positioning information used in the survey. We suggest that with further refinement, magnetic techniques have the potential to make a broader contribution to the discipline of Indigenous archaeology in Australia and become a standard part of site investigations.

Paper Friday 11 December 10.10 am – 10.30 am	Detailed Geoarchaeological Investigations of the Northern Mungo Lunette Ian Moffat[1*], Rainer Grün[1], Tegan E. Kelly[1] and Daryl Pappin[2]

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The Lake Mungo lunette contains one of the premier archaeological records of the early occupation of Australia. The pioneering work of Jim Bowler in this region has provided a robust framework for the interpretation of the archaeological record in this area however much of this work has been focused of the central and southern sections of the lunette. We present results from surface sediment sampling, stratigraphic logging, the interpretation of aerial photography, radiocarbon dating and drilling from the northern portion of the lunette, contained principally on Top Hut station. These results broadly support the scheme proposed by Bowler however provide new insights into the evolution of the lake and erosion regime in this area.

Paper Sunday 13 December 10.10 am – 10.30 am	The Developer's Golden Ticket? A Case Study in Cultural Heritage Management in Western Sydney under Part 3A of the *NSW Environmental Planning and Assessment Act 1979* Sam Moody

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In 2005 the NSW State Government introduced amendments to the *NSW Environmental Planning and Assessment Act 1979* that 'switched-off' the provisions of the *NSW National Parks and Wildlife Act 1974* and the *NSW Heritage Act 1977* that require approval prior to impacts to Aboriginal objects or places and historical relics. The Part 3A amendments were intended to centralise the approvals process from several to one government department - the Department of Planning. The Department of Planning may refer project applications with cultural heritage issues to the Department of Environment, Climate Change and Water or the Heritage Branch for review and comment prior to approval. The Department may also consider comments provided during a referral, but is not obliged to incorporate the comments into the project approval despite having no in-house expertise in Aboriginal cultural heritage management.

This paper examines the implications of the Part 3A approvals framework through discussion of a major infrastructure development in western Sydney - one of the first projects to apply for approval under Part 3A of the EP&A Act. The case study describes one path negotiated through the Part 3A system, focussing on the development approval and execution processes, specifically:

- Government department communication;
- The importance of accurate site identification and management strategies prior to project approval;
- Potential feedback loops in the Part 3A process to improve heritage outcomes; and,
- Differing perceptions of the client, Aboriginal stakeholders, (current and former) Consent Authorities, and the heritage consultant.

Paper Monday 14 December 12.00 noon – 12.30 pm	Specialised Sites or Taphonomic bias? A Review of Factors Influencing the Preservation of non-Molluscan Faunal Remains in Shell Mound Deposits in Northern Australia

Michael Morrison

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Over the course of the past decade or so, researchers investigating shell mound sites throughout northern Australia have begun to suggest that these unique features are the result of quite specialised production strategies. This general argument is based on the tendency for many excavated shell mound deposits to contain a restricted range of faunal remains and a dominance of molluscan resources, typically the bivalve *Anadara granosa*. Consequently, it has been proposed that the production strategies surrounding the formation of these deposits were equally restricted and involved specialised or focussed use of shellfish resources. A fundamental element of these arguments is that non-molluscan faunal materials are usually either entirely absent or represented only in very small proportions in mound deposits. It is argued here that this issue requires more systematic consideration and represents a key problem that needs to be resolved in order to further advance understandings of the formation of these sites. This paper draws on research from across northern Australia as well as work by the author at Weipa to consider the range of taphonomic factors potentially influencing the preservation of non-molluscan remains in shell mound sites.

Paper Saturday 12 December 8.50 am – 9.10 am	Digging at Fromm's Landing Half a Century Ago John Mulvaney

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The Fromm's Landing excavations were the first major digs in South Australia since Hele and Tindale worked at Devon Downs in 1929. I needed to prove to many skeptics that stratigraphy and deep Aboriginal antiquity really existed in Australia; the validity of Tindale's cultural sequence required evaluation. The results proved rewarding, but even more stimulating were the environmental clues. These included evidence for the Murray's greatest flood, and the presence of dingo, thylacine and Tasmanian Devil around 3,000 years ago. It is appropriate at this Adelaide meeting to stress the close collaboration with the South Australian Museum and with the Geography Department of the University of Adelaide.

Poster	Umbo Dissolution Patterns in a Sample of Blood Cockle *Anadara granosa* (L.) from Port Hedland, Western Australia

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The frequency of occurrence of the blood cockle *Anadara granosa* in Aboriginal sites and shell middens across coastal northwestern Australia make it a useful indicator of human activity. *A. granosa* are responsive to environmental changes, and may also act as repositories of environmental data. A sample of *A. granosa* from the Abydos Plain near Port Hedland displays fracture or dissolution patterns that are rarely mentioned in the literature. This study examines these patterns in relation to valve location, size, weight and age, as well as surface topography and composition through the use of a scanning electron microscope (SEM), in the hope of identifying the cause of dissolution. This may provide another method of differentiating shell middens from natural shell deposits.

Paper Sunday 13 December 2.30 pm – 2.50 pm	Sand, Silt, Clay: The Effect of Grain Size on the Geophysical Responses of Indigenous Burial Sites

David C. Nobes

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In the search for unmarked graves, we can eliminate methods, for example gravity and seismic, that lack the resolution to "see" the target graves. Electrical methods can work, but may have practical limitations that preclude their use. The most effective combination of techniques for detecting burials uses magnetic field, electromagnetic (EM) and ground penetrating radar (GPR) methods.

Surveys of Maori ancestral burial sites, with both marked and unmarked graves, have allowed us to test when and where geophysical surveys are most likely to succeed. Results from five sites in three coastal settings along the east coast of the South Island of New Zealand show that burials in *clay* and *silt* (loess) can be identified using geophysical techniques, but burials in *sand* do not always yield anomalous responses. Additional results from a site on the West Coast of the South Island shows that geophysical imaging of burial sites can also be successful in fine-grained and organic sediments overlying glacio-fluvial gravels.

The differences in responses are likely due to the depositional setting. Clay and loess are usually deposited as layers or massive beds, as are the glacio-fluvial gravels and organic-rich sediments, so any disturbance due to burial is relatively clear. In contrast, near-shore, fluvial and dune sands contain sedimentary structures that can be difficult to distinguish from burials, and can mask the geophysical responses of the graves.

Paper Sunday 13 December 3.20 pm – 3.40 pm	Geophysical Imaging of an Early 19th Century Colonial Defensive Blockhouse David C. Nobes[1] and Lynda R. Wallace[2]

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2. Akaroa Museum, Akaroa, New Zealand

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In 1845, the French navy built three blockhouses as part of their defence of French settlers in the Akaroa area, located on Banks Peninsula, near Christchurch, New Zealand. In the 1860s, the blockhouses were removed and the timber used for other purposes. Two of the blockhouses were situated at either end of Akaroa township; the locations are well known and documented. The position of the third, in the village of Takamatua, near Akaroa, is not as well known, but is thought to have been sited in what became a public reserve, first known as the Blockhouse Domain and more recently as the Takamatua Domain.

To aid local archaeological studies, non-invasive, non-destructive geophysical imaging was carried out across the Takamatua Domain. We expected that little if any of the blockhouse itself would remain. However, the nature of the construction was such that we expected to find the defensive trench that enclosed the blockhouse. Using horizontal loop electromagnetic (HLEM) and a new mode of processing HLEM data, we identified a set of linear anomalous responses. A suite of coincident total field magnetic, ground penetrating radar (GPR), and electrical resistivity tomography (ERT) results yielded clear and unequivocal results, which suggest that we have indeed found the blockhouse and its surrounding trench or moat. The three-dimensional (3D) GPR is particularly evocative, as are the two-dimensional ERT images which complement the GPR results.

Poster	Weed Seeds of the Australs: Toward Establishing a Reference Collection for Palaeoecological Application

Shawn O'Donnell and Mat Prebble

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This poster details the process and outcomes of the preliminary stages of the establishment of a reference collection for seeds from selected plant species introduced to the Austral Islands, French Polynesia. The context of this work is provided by Mat Prebble and Nick Porch's ARC Discovery Project examining human impact on island biodiversity. This poster, and the work represented therein, forms a partial research component of the author's Master of Archaeological Science degree at the ANU.

Bulk-sediment samples from vertical cores extracted from five inhabited islands in the Austral archipelago (Rimatara, Rurutu, Tubuai, Raivavae and Rapa) were processed for macrofossil remains. Samples were weighed and their volumes were measured prior to wet sieving through a series of nested sieves. Diagnostic macrofossil remains of both plant and invertebrate species were separated under stereoscopic microscopy. In consort with a species list of weed flora found in the Australs as well as photographs and descriptions of seed morphologies (USDA-ARS), the resultant seed assemblages from the cores were used to prioritise taxa for specimen gathering from herbarium collections. Seed from 20 species of introduced plants (mostly within the families Asteraceae, Cyperaceae and Poaceae) were collected from the Australian National Herbarium in Canberra. Seed specimens were photographed under an optical microscope; these photographs, along with descriptions of seed morphologies and species' geographical distributions and ecologies were then catalogued within a FileMaker Pro database; these entries were then added to the existing reference collection of seeds from Pacific island plants housed within the Department of Archaeology and Natural History at the ANU.

The aim in establishing this reference collection is to aid in the identification of seeds found within stratigraphic contexts of Pacific islands known to have historically supported both Polynesian and European human populations, thus facilitating palaeoenvironmental reconstructions of these contexts. Ongoing and future analyses of these seed assemblages will enhance our ability to characterise the impacts of successive waves of human colonisation upon Pacific island biodiversity.

Paper Friday 11 December 11.20 am - 11.40 am	Working on Country in the Willandra Lakes World Heritage Area Daryl Pappin

Cultural Heritage Officer for the Elders Council of the Traditional Tribal Groups from the WLWHA, and Archaeology Program, La Trobe University, Bundoora VIC 3086, Australia

I am one of the two Cultural Heritage officers from the Three Traditional Tribal Groups in the Willandra Area employed by the ARC-Linkage, the Environmental Evolution of the Willandra Lakes. I am a Mutthi Mutthi man and grew up in Balranald, not far from the Willandra Lakes World Heritage Area. I have long been interested in my cultural heritage and have worked extensively in the Willandra over the years on various management projects. This project allows me to work on country and to look after my heritage for an extended period. I provide the research team with an Indigenous perspective on country and on the way research is undertaken. I have been working in the field with the archaeologists from La Trobe University and the geologists from the Australian National University and have begun systematic monitoring of sites recorded during archaeological fieldwork.

Poster	The Development of the South Australian Museum's New Research Facility at Hindmarsh

Daniel Petraccaro[1] and Keryn Walshe[2]

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The establishment of the South Australian Museum's archaeology store and research facility at Hindmarsh has commenced, after some two years in development. The archaeology collection has lain dormant for many years and would continue to do so without a larger storage facility being made available. The project is being funded by the South Australian Museum and Museum staff and volunteers have overseen the relocation of the collection. The facility offers sufficient space for exploring the various assemblages and undertaking dedicated research as well as space for teaching, workshops and presentations for those in the discipline and the general public. It is hoped that by enhancing access to the collection on a number of levels, there will be greater scholarly and community interest in recognising its significance. Archaeology collections nationally are similarly challenged and it is also hoped that this move will provide a model for other institutions to follow.

Paper Sunday 13 December 9.10 am – 9.30 am	The Archaeological Implications of Advances in Construction Methodologies: How Linear Trenchless Construction can Reduce the Construction Impact on Archaeological Sites Faye Prideaux

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Trenchless technology is a construction methodology that allows the renewal, replacement or new installation of pipeline infrastructure to alleviate the need for open-cut trenching or other large scale excavation. It is generally excepted that trenchless technology reduces social, environmental and sometimes economic concerns associated with traditional construction techniques, but the implications of this technique for cultural heritage, specifically Indigenous archaeological sites, has not been fully assessed. This paper aims to increase the awareness of the trenchless technologies that are available within Australia and how they can be applied to avoid or minimise the impacts of construction or development on archaeological sites. The paper also examines how trenchless technology can be used as a tool for cultural heritage management.

Paper Monday 14 December 2.50 pm – 3.10 pm	Representing Heritage: Location Based Mobile Virtual Environments Shri Rai

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Virtual Environment Technology (VET) can provide an alternative method for representing heritage sites whilst retaining the significance of the site. Such technologies can also be used to augment real world experiences for visitors; permit the recording of visitor experiences; enable visitors to take away digital souvenirs and also enable site owners to perform visitor management. This presentation will highlight how VET coupled with location based capability can enable site owners to maximize the site's utility and visitors to have a more engaging experience of the site.

Poster	To See with New Eyes: A Phenomenological Investigation of a Contact Landscape at the Weipa 'Twenty Mile' Mission, North-Western Cape York Peninsula, Queensland

Claire Ratican, Michael Morrison and Alice Gorman

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This poster focuses on a phenomenological investigation of the Weipa 'Twenty Mile' Mission in western Cape York Peninsula, Queensland. Many early archaeological studies of contact have framed post-contact relations and experiences in terms of domination and passivity (Delle 1998; Long 1970; Rowley 1970; Sutton 2003), while later studies focused on the innovation, agency, resistance and accommodation of Indigenous people (Birmingham 1992; Harrison 2004; Lydon in press; Silliman 2001; Trigger 1992). Phenomenology is the study, or description, of things as they are experienced in the world. Phenomenology enables us to evaluate contact relations through new eyes by focusing on bodily experience, however its potential to reveal new insights into Australia's contact history has not yet been tested. The primary aim of the research was to understand the ideological and social construction of the Twenty Mile Mission contact landscape and how people experienced it using phenomenology. The specific focus was existential phenomenology, which explores engagement with the perceived world, mediated by the human body, which is able to move around and experience the world through the senses.

To recreate phenomenological experiences of people and place within the Mission landscape, a combination of archaeological survey and historical photograph analysis was used to understand how the past built and natural environment would have impressed upon the body sensually. This was also teamed with an investigation of diaries written by Moravian missionaries between the period 1909 to 1917. The information extracted from the diaries was used to plot particular people in specific places within the landscape. Following this, recorded events were thematically categorised to explore the social and ideological function of the Mission places where these events occurred. This information was then plotted on to maps of the Mission landscape produced by the survey using GIS. This enabled new insights into the interplay between people and place, sensuality and meaning within the contact Mission landscape and past Indigenous experiences of this. The phenomenological reconstructions demonstrated that, although some experiences of Mission places were common to many inhabitants, Indigenous experience was comprised of many deeply personal, individualistic perceptions of space and place. Moreover, while mechanisms of visual control were at work at the Mission, archaeological data and diary analysis suggested that aurality played a vital role in Mission experience, which transcended these visual boundaries. This study demonstrates the potential phenomenology holds for exploring past experiences of both Australia's contact history and other historical archaeological research directions.

Poster	An Investigation of Hunter-gatherer Mobility in the South West of Western Australia: Moorillup Pool, Kalgan Hall, Burswood and Hunter River East

Wendy Reynan

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In the south west of Western Australia it has been suggested that past Aboriginal groups concentrated their activities in areas of resource abundance, such as at the margins of forests, in coastal areas and wetlands and along rivers and lakes. The congregation and dispersal of groups is argued to have been guided by inter-group reciprocity and seasonal or periodic resource abundance. This previous research is based upon broad-scale archaeological data and has relied heavily on ethnohistorical information to reconstruct settlement patterns. This study aims to contribute to broad questions of mobility patterns in south west Australia by investigating if differences in relative occupation intensity can be identified from the lithic assemblages of four sites and whether the results reflect past research into settlement patterns. The relationship between estimated resource abundance and occupation intensity is examined through the archaeological, environmental and ethnohistorical records at Moorillup Pool, Kalgan Hall, Hunter River East and Burswood. These sites are selected for their locations in different environments with varying resource abundance. The assemblages from the four sites are all late Holocene and were previously recorded by Bill Ferguson and Caroline Bird in the late 1970s and 1980s. Relative occupation intensity is identified at the sites through the examination of the degree of material utilisation, including measures of core reduction intensity and tool manufacture. The results of the lithic analysis demonstrate differences in relative occupation intensity between sites that provides support for the notion of 'congregative' and 'dispersive' site types, and refines previous research in the region by suggesting that groups stayed for longer periods in resource rich areas. This study contributes to a growing body of research that demonstrates that analysis of lithic debitage can successfully contribute to our understanding of prehistoric organisational strategies.

Poster	Old 'Dingoes', New Tricks: An Actualistic Study of Dingo Scat-Bone 'Signature Patterns' applied to Faunal Assemblages from Witchcliffe Rock Shelter

Jess Reynolds

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This research concentrates on an examination of dingo scat-bones. Arriving in Australia during the mid-Holocene, around 3 500 – 5 000 BP, as dingoes live with Aboriginal peoples, use caves as dens, and scavenge bone refuse, they have the potential to have substantially contributed to Holocene archaeological sites. 'Signature patterns' of damage can be attributed to specific carnivores because carnivores have been found to modify bones in both distinguishable and patterned ways. Past actualistic research undertaken from the mid-1980s of dingo scat-bones contributions has focused on the size and shape of bones, while examination of meal refuse has indicated the range of tooth mark types dingoes produce. More recent actualistic research has stressed the examination of tooth mark sizes, particularly pit sizes, to identify specific carnivore agents as they are a direct result of tooth size. This study builds on previous work of dingo contributions to archaeological sites by examining scat-bone sizes, taxa and element, and most importantly sizes of tooth marks to enable comparisons with measurements of modifications produced by other non-human carnivores.

The main aim is to examine whether 'signature patterns' of modification can be attributed to dingo scat-bones, whether captivity has an influence on actualistic studies of carnivore modification, and to examine dingo tooth pit sizes. Dingo scats collected from both captive and wild dingoes were disaggregated and the scat-bones were subject to analysis. The differences between the sizes of the bones and levels of bone destruction in the two actualistic collections are a result of prey size consumed and no differences attributable to captive or wild living situation are found. Dingo pits appear to be distinct from other non-human carnivore tooth pits, enabling the identification of dingo contributions to the archaeological record.

The constructed 'signature pattern' is tested at Witchcliffe Rock Shelter in southwest Australia where occupation of the site dates from around 800 BP, leaving dingoes the only large predators apart from humans that could have contributed bone to the deposits. The lack of correlation between the total amount of bone with a number of archaeological categories and the high level of fragmentation indicate the possibility of carnivore contributions. The conformity of a large proportion of the bones to the 'signature patterns' of the actualistic scat bones, in combination with the presence of tooth pits and other modifications which match those produced by dingoes, indicates that there are dingo contributions to the faunal assemblage at the site. Not all bones conform to this pattern however, and the non-bone faunal remains correlate with archaeological remains. The faunal assemblage appears to be 'dual patterned' with contributions by both humans and dingoes.

Paper Friday 11 December 4.40 pm – 5.00 pm	Observations of a Multi-disciplinary Researcher Working in Native Title Amy Roberts	

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This paper explores the challenges faced by archaeologists working in progressively complex legal environments such as native title. It examines a number of common problems that anthropologists and legal representatives encounter in heritage survey reports, work area clearances and conservation plans written from an archaeological perspective. In particular, this paper proposes to assess the following issues: 1) Difficulties in contextualising contemporary assertions of "connection to country" against the ethno-historical record; 2) Complexities relating to the inclusion of anthropological materials in archaeological reports; 3) The importance of acknowledging the broader meaning of archaeological sites for some claimant groups; and 4) Other general issues regarding consultation with Indigenous communities. It will be argued that there is a need for additional targeted anthropological training for those archaeology students planning to work in the field of Indigenous heritage. In particular, it is asserted that basic level training should be provided on topics such as ethnographic analysis of group boundaries and the mechanisms by which relationships to land and waters are established.

Paper Monday 14 December 12.20 pm – 12.40 pm	'The Way it Changes, like the Shoreline and the Sea': The Sandalwood River Archaeological Project, Mornington Island, Gulf of Carpentaria

Daniel Rosendahl[1], Sean Ulm[2], Richard Robins[2,3], Errol Stock[4] , Paul Memmott[1] and Geraldine Jacobsen[5]

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Claims for mid-Holocene occupation of Mornington Island (Memmott et al. 2006) are re-examined using new data from the Sandalwood River catchment. These claims are significant, as no unambiguous evidence for mid-Holocene occupation of islands in northern Australia has been forthcoming (Sim and Wallis 2008). Using data from shell mounds and natural bioherms, dominated by the black-lipped oyster *Striostrea mytiloides*, we demonstrate that human occupation of the Sandalwood River catchment only dates to the late Holocene after millennia of large-scale landscape development closely linked to marine transgression. A model of local landscape development is presented.

Paper Sunday 13 December 9.10 am – 9.30 am	Defining Heritage – Reality and Practice Challenge the Narrow Confines of the Law: A Case Study of Heritage 'Boundaries' at the Gummingurru Stone Arrangement Site Annie Ross

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Aboriginal desires for the management of the Gummingurru stone arrangement complex, a once sacred men's initiation site on the Darling Downs, south east Queensland, require the incorporation of notions of living heritage and resurrection of cultural traditions that challenge political and legislative definitions of cultural heritage. The archaeological approaches to cultural heritage that inform Queensland legislation conflict with the management programmes designed by Gummingurru custodians, whose management aims include modifying existing stone arrangements and digging up buried stones to add to the ancient stone arrangements, often creating new motifs in the process. While recent academic reviews of the definition of cultural heritage accommodate the desires of the Gummingurru custodians to renew the site and develop it as a place of reconciliation and education for all Australians, legislative processes do not. In part, this is because such aspirations do not meet Western constructs of 'preservation' and 'traditionalism' as upheld in the *Queensland Aboriginal Cultural Heritage Act 2003*. In this paper I review this Act's definitions of 'heritage' that both explicitly and implicitly inform cultural heritage management opportunities at cultural heritage places like Gummingurru and demonstrate that legislative provisions fall well behind Indigenous notions of heritage and current cultural heritage discourse on 'living heritage'.

Paper Sunday 13 December 11.40 am – 12.00 noon	Recent Research at Mulka's Cave, an Aboriginal Rock Art Site in SW Australia: The Implications of the Erosional Effects of Cultural Tourism Alana Rossi

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Mulka's Cave is a profusely decorated boulder at The Humps, near Wave Rock, a much-promoted granite weathering feature at Hyden. About 80,000 tourists visit both sites each year. As a result, about 1 m of deposit has been eroded from within Mulka's Cave over the last 50 years, as datable pictures of the cave mouth demonstrate. This erosion is attributed to trampling, which may have been facilitated by test excavations conducted in the cave in 1988. No trace of the test pit now remains, making it difficult to reassess the excavators' findings – in particular the one 14C date they obtained, which is anomalously young (420 BP) by comparison with the condition of the artwork. Excavation elsewhere at the site shows it has been visited since 5000 BP, an age concordant with the condition of the artwork. Additional charcoal samples were recently submitted to Waikato. The implications of their ages will be discussed at the conference.

Paper Saturday 12 December 2.00 pm – 2.20 pm	Open Heritage Australia Illya Santos

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One of the aims of this session is to get people in heritage, interested and involved in the development and usage of open source and/or geospatial technologies. This area has its own language and terminology which, to a novice, can be the first hurdle to overcome. To that end, I am going to be giving a brief introduction into the geospatial and open source realm.

"Open archaeology" was a concept developed by Oxford Archaeology as a way of fulfilling their goals for the sharing and distribution of archaeological knowledge. It is an umbrella term that brings together open data, open standards and open source concepts. In the second half of my introduction I am going to talk about these concepts in terms of archaeology and cultural heritage management.

I will begin by looking individually at each of these components, firstly to outline each in terms of development, licensing, history and current application in Archaeology today. Secondly, I would like to explore more specifically how open data can be applied to historical archaeology in Australia, then I would like to highlight some of the ways in which open source development is/can be applied to Indigenous archaeology in Australia.

Paper Monday 14 December 9.10 pm – 9.30 pm	An Evolutionary Approach to Flaked Stone Artefact Technology in the Inland Pilbara Michael Slack[1] and Amy Stevens[2]	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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Michael Slack Email: Michael.Slack@scarp.com.au
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This paper applies an evolutionary approach to analysis of flaked stone artefacts recorded from archaeological surveys conducted in the inland Pilbara, Western Australia. Two particular samples are compared; that of a region bordering a floodplain covering an area of 30 km^2 and the second a series of mesa and valleys spread across 40 km^2. We argue in this paper that differences in artefact reduction are responses to resource procurement strategies rather than just raw material availability; and that between these two different study environments stark contrasts can be seen in lithic assemblages. In this analysis we highlight the fact that the inland Pilbara is not one 'semi arid' refuge landscape, but rather a complex environment of habitats and patches differentially used by Aboriginal people.

Paper Sunday 13 December 11.40 am – 12.00 noon	Auditing Cultural Heritage: A Second Opinion Can Count Sue Smalldon

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In this paper I argue that cultural heritage audits need to become standard best practice in cultural heritage management. This paper will draw on two examples of how applying Queensland Aboriginal heritage legislation may have led to unsatisfactory results for heritage conservation had auditing not occurred. The examples also demonstrate the value of effective consultation and good relationships with Traditional Owner groups. The *Queensland Aboriginal Cultural Heritage Act 2003* 'Duty of Care' provisions specify that 'A significant Aboriginal area or object must be particularly significant to Aboriginal people'. In effect it means it is primarily the Traditional Owners who decide if a place is significant to them. In the two case studies discussed in this paper, heritage monitoring occurred by Traditional Owners. During audits with the same group, we found artefacts where no artefacts were previously found and in another case found that a scarred tree treated as an Aboriginal place that needed managing, was not scarring as a result of cultural use and so not a place that required ongoing management. The paper explores the issue that the legislation calls on the Traditional Owners to 'know all, see all and be all' and therefore fails the archaeological record.

Special Presentation Sunday 13 December 4.45 pm – 5.15. pm	The Australian Research Council: Policy, Programs, Processes, Prospects Claire Smith

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This presentation aims to help archaeologists, especially Early Career Researchers, become more familiar with the Australian Research Council (ARC), the major funding body for archaeological research in Australia. It will outline the ARC's overall policy objectives, the funding schemes administered by the ARC, the processes involved in applying for funding, and the prospects of success in each program. In addition, it will briefly discuss the newly established Research Management System (RMS) and consider the possible impact of the current review of peer review processes, especially the potential introduction of Research Opportunity and Performance Evaluation (ROPE).

Paper Saturday 12 December 3.00 pm – 3.15 pm	Accessible GIS: Archaeological Site Models in Google Earth Stafford Smith

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Google Earth is now globally distributed: it is free to download and install anywhere in the world with an internet connection. Its revolutionary nature as a worldwide basemap of satellite imagery, coupled with easy learning curve navigation controls also make it widely accessible. In this paper I will demonstrate how user created data can be distributed across the world and viewed using Google Earth, making it a viable platform for the distribution of GIS type spatial models to the non-GIS savvy. As case studies I will use archaeological site models of three contact sites in the Pilbara region of northwest WA.

Paper Saturday 12 December 10.10 am – 10.30 am	"It Found Us, We Didn't Find It": How an Archaeological Discovery in Vanuatu has Changed the Game in Pacific Archaeology

Matthew Spriggs[1] and Stuart Bedford[2]

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The discovery of the Teouma Lapita cemetery site on Efate Island, Vanuatu came about as a result of the serendipitous meeting between bulldozer driver Charlie Ngati and Vanuatu Cultural Centre fieldworker Salkon Yonah of Epi Island, who had recently attended an archaelogical training program run by the authors of this paper. Recognising the importance of the piece of Lapita pottery souvenired by Charlie from a quarry site for soil to build the embankments of a prawn farm, Salkon alerted the National Museum who called in Spriggs and Bedford to see if there was anything left to 'rescue' from the now-abandoned quarry. Over the five excavation seasons so far undertaken at Teouma a strong international and interdisciplinary team has been brought together, some 80 skeletons have been excavated from this earliest of Pacific Island cemeteries, six complete and another 50+ fully reconstructible in design, size and shape Lapita pots have been recorded, bones of giant tortoises hitherto only known from Pleistocene-aged fossil deposits have been recovered, thousands of local schoolchildren have visited and dug at the site and it has become the focus of national and international media attention. Certainly in our careers it hasn't got any better than this!

Poster	Palaeoecological Investigation of the Human Occupation of Rainforest on the Atherton Tablelands, North Queensland

Lincoln Steinberger[1], Patrick Moss[1], Simon Haberle[2], Richard Cosgrove[3] and Åsa Ferrier[3]

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Recent research has detailed some of the complexity of the archaeological and palaeoecological history of the wet tropics region of North Queensland. Historical records of 'pockets' of open vegetation within the dense rainforest of the Atherton Tablelands indicate the presence of sites amenable to human occupation. Historical evidence suggests that these pockets were kept open by Aboriginal people through regular burning. Identification of the location of these pockets within the modern landscape has in some cases revealed close proximity to depositional sites which may be suitable for palaeoecological investigation. These sites of co-occurrence of palaeoecological and archaeological interests provide an anchor from which investigation of human interaction with rainforest can be launched. Analysis of pollen and charcoal records from these sediments allows the production of local vegetation and fire histories, revealing the antiquity, extent, and floristic composition of open pockets, and the role of fire in their maintenance. The sites can act as a link between archaeological and palaeoecological histories of the Atherton Tablelands. They present an opportunity to extend the history of ethnographically observed facets of Aboriginal rainforest occupation, and to investigate the human interaction with rainforest environments of the wet tropics of North Queensland. Preliminary results from two such pocket sites in the central Atherton Tablelands are here presented.

Paper Friday 11 December 11.40 am – 12.00 noon	Shifting Sands: The Empirical Structure of the Mungo Archaeological Record and its Implications for Landscape Archaeology Nicola Stern

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In the Willandra Lakes World Heritage area, traces of past human activity are strewn across the surfaces of vast, eroding landforms made up of three-dimensional sedimentary bodies that record long and complex depositional histories. They have the potential to provide unparalleled insights into the history of human settlement in this area and into the technological, economic and social strategies that people devised to cope with some dramatic and long term changes in the landscape and environment. However, realizing that potential requires the development of methodologies tailored to the empirical characteristics of this particular record. It is a record that includes different types of archaeological occurrences, with different potential for generating information about the types of activities in which people engaged at different times in the past. Some components of this record represent a lag of debris that could have originated from any of the sediments accumulated over the past 55,000 years whilst others retain measurable degrees of stratigraphic integrity; some represent time-averaged agglomerations of debris whilst others arguably represent the material traces of individual actions and events. This record thus presents a rare opportunity to investigate the relationship between the material traces of individual events and actions and the time-averaged agglomerations that are the usual purview of the archaeologist. The strategies being employed to document these past activity traces are designed to provide both snap shot images of distant lives and an investigation of what patterned distributions of debris can reveal about the long term history of human settlement in this area.

Paper Saturday 12 December 4.45 pm – 5.00 pm	Investigating the Submerged Post-Glacial Landscapes of Port Phillip Bay Hannah Steyne

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Until recently maritime archaeologists in Australia and around the world have focused on the study and management of historic shipwreck and coastal infrastructures sites, whilst historical and Aboriginal archaeologists have investigated sites on dry land. This project crossed the traditional discipline boundaries to investigate the potential for survival of prehistoric archaeology beneath the waves in Australia.

The main aim of the project was to test a methodology used elsewhere in the world to investigate the potential for the survival of ancient land surfaces beneath modern marine sediment and sea water. As the project was focussed on testing a methodology, rather than collecting new field data, Port Phillip Bay was selected as the study area, as it was known that marine geophysical survey and archaeological investigations had taken place, and been published.

The project 'reconstructed' the ancient landscape of Port Phillip Bay, prior to inundation, through a reassessment of previously collected and published data from a range of disciplines. Data from paper rolls of seismic data collected in the 1970s was extracted and re-processed to recreate 3D digital terrain models of the ancient topography. Information from geotechnical, environmental and landscape studies provided data for vegetation reconstructions, in addition to new pollen analysis undertaken on 35 year old cores. Archaeological reports, historical data, Dreamtime stories and surviving Aboriginal crafts and traditions all assisted to provide a view of human activities in the area.

The information collected during this study has been drawn together to form the basis of a short animation and reconstruction of a post-glacial campsite. The animation was developed in conjunction with an animator at Monash University who provided the technical know-how.

Paper Sunday 13 December 3.40 pm – 4.00 pm	Managing Shipwrecks you Can't See: Geophysics and Historic Shipwreck Sites Hannah Steyne

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Surveying and managing historic shipwrecks sites can be a lengthy and complicated process. Add to the normal difficulties of archaeological site survey: deep water, poor visibility, currents, short dive windows, and you have the potential for field seasons stretching over years. Obviously this lengthy process is not appropriate for actively managing sites which can change (degrade) from season to season and year to year.

There are a range of site conditions which make survey or monitoring of shipwrecks sites very difficult, but where geophysical data could play a huge role. In Victoria, over 10% of the located historic shipwrecks are in water deeper than 30 m, which is beyond the safe working dive limits of Heritage Victoria staff. We also have numerous sites in remote areas of the State, in areas with fast tidal streams or in high shipping areas. Occasionally we also have low visibility to contend with.

With increasing numbers of divers able to access shipwreck sites in water up to 100 m, in addition to increasing development around the coasts, changing weather patterns and potentially changing sea levels, it is becoming more important than ever that heritage agencies develop a way to 'see' and manage previously 'invisible' shipwreck sites.

This paper will outline some of the problems faced by heritage agencies responsible for managing shipwreck sites we can't see, and outline a couple of examples of how marine geophysical techniques have been employed both in Australia and the UK to survey and manage these difficult sites.

Paper Monday 14 December 9.30 am – 9.50 am	An Archaeological Study of Shell Middens at the Coorong, South Australia

Claire St George[1], Lynley Wallis[1,2], Chris Wilson[1,3], Steve Hemming[4] and Ngarrindjeri Heritage Commitee[5]

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This paper presents the results of an investigation into shell middens at Long Point, Coorong, South Australia. The Coorong has been the traditional *ruwe* of the Ngarrindjeri people for thousands of years and is uniquely situated in close proximity to a range of coastal, estuarine and freshwater ecosystems. This ecological biodiversity has resulted in an archaeologically rich and diverse coastal landscape, yet surprisingly little is known about Ngarrindjeri occupation and subsistence in this region prior to the arrival of Europeans. Emerging out of a culturally aware and reflexive approach to archaeology, this research was initiated as an integral component of a larger natural heritage management program undertaken in collaboration with, and at the request of, the Ngarrindjeri Heritage Committee and the Dapung Talkinjeri Aboriginal Corporation. It explores how shell midden sites at Long Point can contribute to an understanding of Ngarrindjeri occupation and subsistence in the region during the mid- to late Holocene, and hence within the Coorong region as a whole.

Using quantitative methodological approaches to shell midden analysis, the results of field surveys and excavations carried out at Long Point in 2007 and 2008 are presented. Occupation at Long Point was shown to be largely confined to the late Holocene period, post-2,500 BP, and comprised predominately short-term, ephemeral visitation during summer months with a targeted focus on marine resources. This pattern fits with a proposed period of population expansion and intensification of resource use in the Coorong (Luebbers 1978), as well as more general changes known to have occurred across Australia during the mid- to late Holocene. As there had been no systematic archaeological investigations within the Coorong since Luebbers' work, this research builds upon his preliminary investigations, contributing to a regional and broader continental narrative on coastal archaeology during the Holocene, including wider academic archaeological debates surrounding intensification.

Paper Friday 11 December 4.20 pm – 4.40 pm	The Logic of Wik Camping, Cape York Peninsula Peter Sutton	ACHM AUSTRALIAN CULTURAL HERITAGE MANAGEMENT

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The picture of pre-settlement Wik camping that arises from hundreds of ethnographic site records is not one of long-term wet season base camps alternating with an opposite pattern of high mobility and mainly ephemeral use of occupational sites in the non-monsoon parts of the year. While the wet season was one of relative immobility, people still visited short-term camps on trips away from their base-camps during the monsoon. It seems that there was in fact much use of longer-term or base camp sites throughout the Wik year regardless of season, so a base camp + forays pattern is virtually the norm. However, wet season camps, sited as they were above the flood-line and in forested areas, would not have been subject to the same possibilities for scouring and mobilisation of archaeological materials presented by many of the more low-lying dry season sites. This would affect the long-term record.

Poster	Archaeological Action Figures: A Fun Approach to Archaeological Theory and Method Cassandra Taylor, Shannon Smith, Bianca Petruzzelli and Sarah Keillor

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"Archaeological Action Figures" depicts the transition from the old guard archaeology to the new guard archaeology and a glimpse of future directions. This poster illustrates the changes within archaeological theory and methods over the past two hundred years. Each segment of the timeline corresponds to the time periods in which a particular theory was popular. Archaeologists who have made major contributions to the development of archaeological theory are depicted in the form of dolls made by students in the third year topic 'Archaeological Theory and Methods' at Flinders University.

"Archaeological Action Figures" timeline focuses on three schools of thought: cultural history, processual archaeology, post-processual archaeology, culminating in a consideration of today's archaeology. Many archaeologists today do not adhere to one school of thought; instead they take aspects of the various theoretical approaches and apply to them to the challenges of contemporary archaeology, irrespective of their particular sub-discipline.

Inspiration for this poster occurred during the archaeology topic titled 'Archaeological Theory and Method'. For one assignment students are required to create a doll of an archaeologist and research their theoretical views. As a physical depiction of the archaeologist, these archaeological action figures are used to promote discussion of their theories and disciplinary achievements. They are presented to the class so that all students gain an understanding of the theories of a range of archaeologists. Introducing an in-depth look at archaeological theory and method, this class approaches theory in a new and enjoyable way that ensures students learn about various theoretical and methodological approaches in archaeology.

Paper Sunday 13 December 4.00 pm – 4.20 pm	Efficient, Large-Scale Archaeological Prospection using a True 3D GPR Array System

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Recent advances in Ground Penetrating Radar (GPR) hard- and software have made rapid large-scale acquisitioning of true 3D GPR data possible. The Malå Imaging Radar Array (MIRA) is a 16-32 channel integrated GPR system which produces a simultaneous collection from up to 15 receiving antennas. The laborious setup of survey grids and placement of profile lines on the ground is superseded by the use of a total station or RTK-GPS. The GPR and positioning data from the MIRA system is directly handled in the rSlicer software avoiding complicated and time consuming import routines. The software allows the pre-processing, interpolation, coordinate system transformation and 3D migration of the GPR data, followed by interactive interpretation of the observed features. The results can be printed and exported as geo-referenced TIFF or DXF files. Thus, a considerable increase in both GPR survey speed, sampling density and data processing speed compared to single channel measurements is achieved.

MIRA datasets from an archaeological investigation is presented and compared to a traditional single-line GPR dataset over the same area. The difference in acquisitioning and processing speed is discussed and the qualities of the two results compared.

Paper Friday 11 December 12.00 noon – 12.20 pm	A GIS Perspective on the Mungo Lunette Surface Material Jacqui Tumney

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The surface of the Lake Mungo lunette is draped with extensive scatters of archaeological material. This project is testing one potential method for obtaining useful information from these scatters, focussing on a particular type of deflationary setting. Interpretation of the behavioural information contained within these scatters is complicated by the long time-frame, complex depositional history and the past and present erosion regime; surface material could potentially encompass the traces of tens of thousands of years of the activity of the people who inhabited this unique Pleistocene landscape. Previous studies have investigated the effect of erosion, animals and people on the distribution of artefacts, but have not had the benefit of the high precision electronic recording equipment and GIS software that is currently available. Such equipment greatly enhances the ability to accumulate, store and analyse large quantities of location and attribute data. Stratigraphic, geomorphic and topographic mapping have been combined with artefact location to see how the distribution of artefacts relates to current landforms and landform processes and to the ancient landscape, in order to understand the structure of the archaeological record. Sediment dating will be combined with the outcomes of GIS modelling to determine an appropriate spatial and temporal scale at which to interpret the behavioural information contained within the record, and detailed technological analysis of the stone artefacts will contribute to that knowledge. Some preliminary results are presented.

Paper Saturday 12 December 2.30 pm – 2.45 pm	UWA Computer Science and Systems Engineering Students Building Software for Archaeology

At UWA Archaeology we have been working with final year computer science students for a project module, to build recording and data storage systems specific to Archaeology and cultural Heritage. Two students, one from each work group, will be giving short 5 minute presentations on the software they have been developing. They will be looking at the technical aspects and challenges, but also the challenges of working with a discipline that straddles science and humanities.

Paper Monday 14 December 11.40 am – 12.00 noon	Excavations at Parnkupirti, Lake Gregory, Great Sandy Desert: OSL Dates for Occupation before the Last Glacial Maximum

Peter Veth[1], Mike A. Smith[2], Jim Bowler[3], Kathryn E. Fitzsimmons[4], Alan Williams[5] and Peter Hiscock[6]

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We report on early occupation from the Parnkupirti site on Bungabiddy Creek at Lake Gregory, on the edge of the Great Sandy Desert of North West Australia. Lake Gregory is unique in that it has remained a freshwater system during the Late Quaternary with catchment from Sturt Creek to the north. OSL dates from excavations, and stratigraphic correlations between dated exposures along Bungabiddy Creek, show artefacts are in situ in sediments dating ~50 - 45 ka. The deep stratigraphic section at Parnkupirti also provides a long record of the Quaternary history of Lake Gregory and provides a climate history for North-West Australia.

Paper Monday 14 December 12.20 pm – 12.40 pm	The Role of Information Exchange in the Colonisation of Sahul Peter Veth[1], Nicola Stern[2], Jo McDonald[1], Jane Balme[3] and Iain Davidson[4]

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During the past decade, a number of attempts have been made to re-evaluate the supposed distinctiveness of the archaeological traces of anatomically modern humans in an effort to resolve the apparent mismatch that exists between the fossil and archaeological records of modern human origins. These reviews have shown that the items of material culture under consideration appear intermittently in the archaeological records associated with the earliest populations of modern humans as well as having quite variable expression in late Pleistocene records associated with populations whose morphology, genes and behaviour were unquestionably modern. This is not surprising, given that only a few of the traits under discussion have actually been linked to specific cognitive or behavioural capacities. Here we review the material evidence for symbolic behaviour in Sahul, discuss the behavioural inferences that can be drawn from them, and their implications for current understanding of the circumstances in which symbols are likely to have been manifest in the material record. Recent reviews of the early record of Sahul differ in their assessments of the abundance and import of material symbols and their bearing on discussions of modern human origins. As Sahul was colonized after modern anatomy and symbolic behaviour were already established, its archaeological traces present a yardstick against which other records can be compared. Thus way in which this record is interpreted and presented is critical.

Paper Sunday 13 December 12.00 noon – 12.20 pm	Archaeological Investigations of Rock Art at Middle Park Station, Northwest Queensland

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Located in the foothills of the Gregory Ranges, northwest Queensland, the sandstone rockshelters of Middle Park contain a rich stencilled rock art assemblage. Commonly considered an extension of the central Queensland stylistic province, the rock art of the northern highlands is little known. Here we describe the analyses of motifs and techniques undertaken at Middle Park, including detailed studies of hand variation and material culture stencils. The results of this investigation suggest that similarities observed between the central and northern Queensland assemblages are largely superficial, thus supporting earlier contentions by Gorecki, Morwood and colleagues that the former is worthy of consideration as a Province of its own. The social implications of this are also explored, and themes such as social interaction, trade and territoriality are addressed.

Paper Monday 14 December 11.20 am – 11.40 am	Gledswood 1 Shelter: Initial Radiocarbon Dates from a Pleistocene Aged Rockshelter Site in Northwest Queensland

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Like elsewhere in Australia, the archaeology of northwest Queensland has focused on the antiquity of occupation and the continuity of that occupation through the Last Glacial Maximum (LGM), in an attempt to better understand the adaptive capabilities and strategies of early humans. As a biogeographic corridor Veth (1989, 1993) hypothesised that the northwest Queensland savannah, should contain 'early' sites; and furthermore that with the climatic deterioration associated with the LGM, such sites should fit one of two patterns: (1) they will be abandoned and display a cultural hiatus; or, (2) if located in resource-rich zones within catchments ('local refuges'), they will continue to be utilised, though subsistence strategies will be modified to rely more heavily on locally available resources. However, outside the Riversleigh refugia, sites pre-dating the LGM have not yet been located in the northwest Queensland savannah. The patterning of sites raised the question as to whether the wider northwest Queensland savannah corridor was indeed occupied in the pre-LGM period.

In this paper we present the initial results of radiocarbon determinations from the recently excavated Gledswood Shelter 1 site. This site is the first rockshelter outside a well-watered local refuge in the savannah corridor of northwest Queensland to produce evidence for human occupation in the pre-LGM period, thus fitting with the transformation model presented by Hiscock and Wallis (2005) and the biogeographic model of Veth (1989, 1993). The presence of stone artefacts, ochre and charcoal at Gledswood Shelter 1 are testimony to its repeated use throughout at least the last 28,400 years, though it is not yet clear whether it was continuously occupied or abandoned through the height of the LGM before being reoccupied in the Holocene.

Public Lecture Sunday 13 December 7. 00 pm – 9.00 pm	Prehistoric Exploration of the World's Longest Cave Patty Jo Watson	

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In Eastern North America, systematic archaeology in big caves with miles of dark zone began during the 1960s in Salts Cave and Mammoth Cave, Kentucky, portions of the world's longest cave, the Mammoth Cave System: 370 mapped miles and still going. Artifacts and other items 2000 to 4000 years old are scattered through 15-20 miles of dry cave passages. These include torch and campfire debris, torch smudges on walls and ceilings, cordage, discarded or lost footwear, fragments of bags and baskets, as well as hundreds of human paleofecal deposits, and the desiccated bodies of two ancient cavers.

Research goals, research techniques, and interpretative frameworks for cave archaeology have changed significantly over the past 45 years with the definition of a pre-maize agricultural complex in Eastern North America, accumulation of data concerning the distribution of dark-zone cave sites in the midcontinental karst of the United States, and of information concerning prehistoric as well as protohistoric cosmologies. In addition, new technology has become available such as AMS radiocarbon dating, Scanning Electron Microscopes, and laser transits as well as other digital hardware and software. In this presentation I summarize current understanding of specific prehistoric activities in the Mammoth Cave System, and of major trends characterizing archaeology underground in the Eastern Woodlands of the USA from mid-1960s to the late-2000s.

Paper Sunday 13 December 11.20 am – 11.40 am	Attempts to Date some Rock Art Sites in the Cue Region, Western Australia

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In 2002, test pits were excavated into the deposits within three decrated rockshelters located near Cue, in central WA. The shelters selected for investigation were: Gidgee, containing a shelf of weathered, pecked cupules and more recent petroglyphs; Gilla, containing both pictograms and an unusual array of well-preserved petroglyphs; and Yarraquin, containing highly weathered and unweathered petroglyphs and pictograms. Gidgee appears to have been in use between 4500 and 2000 BP. The dates from the other shelters are more difficult to interpret. Those for Yarraquin are inverted, but suggest the shelter was in use 1900-1500 BP, while Gilla appears to have been visited briefly about 1900 BP. Further charcoal samples from all three sites were recently submitted to Waikato to clarify their periods of occupation. The results will be discussed.

Paper Monday 14 December 12.00 noon – 12.20 pm	Dating the Initial Colonisation of Sahul: Why there is a Discrepancy Between 14C and TL, OSL, ESR, AAR and U-series and Why it Should Matter to the 'New Guard' Esmée Webb

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Archaeological sites throughout Australia have 14C ages back to 40 ka, but no older. When such sites are re-dated using TL, OSL, ESR, AAR or U-series, the resultant ages are usually millennia older than the 14C dates; causing some researchers to question the validity of TL and OSL, in particular. This criticism is ill-founded. The 'plasticity' of 14C 'years' is well-known. Moreover, at 40 ka, 14C is at the limits of countable activity. It is not yet possible to convert such old ages to calendar years, but they are likely to be at least 10 ka too young. If Australian Archaeology is to progress, the reasons for the discrepancy between 14C and 'absolute' time need to be better understood. Furthermore, if the older dates are reliable, then it appears that anatomically modern humans reached Sahul long before they managed to establish themselves in either Europe or island Southeast Asia. Hence, correctly dating the oldest Australian sites has implications for the origins and spread of AMH.

Paper Sunday 13 December 4.20 pm – 4.40 pm	Archaeological and Palaeoecological Investigations of a Probable Late Pleistocene Assemblage from Nerang, South East Queensland Michael C. Westaway[1] , Hague Best[2], Patrick Moss[3], Craig Sloss[4] and Tamara Daus[3]

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Sydney B. Skertchly was a Queensland based state geologist who in retirement undertook investigations around the Nerang River and associated wetlands in an attempt to establish the antiquity of Aboriginal occupation in Australia. He had similarly investigated the antiquity of archaic hominins in Europe, applying the principles of stratigraphy during his earlier career as a geologist with the English Geological survey and demonstrating that the age of humanity extended into the interglacial periods (Skertchly 1876). His arguments were strenuously resisted by geologists and antiquarians throughout much of the late 19th century. Skertchly's work around Nerang commencing in 1913 would appear to represent the first use of stratigraphic principles to demonstrate a possible Pleistocene antiquity for Aboriginal Australians. Sadly Skertchly's investigations into early occupation received a similar level of disinterest from his colleagues in Australia. It was not until the work of Edmund Gill in the proximity of Keilor and John Mulvaney at Kenniff Cave that a Pleistocene antiquity for Aboriginal occupation of Australia was finally accepted. In this paper we outline a) the initial results of investigations into the archaeological record collected by Skertchly and held within the Queensland Museum and b) the palaeoecology of the Nerang area, including preliminary pollen results that indicate the sites are likely to be Late Quaternary in age. The palaeoenvironmental record in the vicinity of Nerang in combination with the palynological records from nearby North Stradbroke Island hold great potential to provide a detailed picture of environmental change for the subtropical region of eastern Australia covering at least the last 40,000 years and perhaps extending as early as the stage 5 interglacial. The sedimentological and palynological analyses that form the basis of this study are providing a valuable interpretive framework for understanding the nature of the environment occupied by Aboriginal hunter-gatherers in the area during the Late Pleistocene.

Paper Monday 14 December 2.30 pm – 2.40 pm	Designing the Virtual for Immersive Heritage Experiences Josh Whitkin

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How do virtual world designers interpret a heritage site? This session shows how the designer's on-site experience influences virtual world design decisions. The designer stands in the desert, combining his sensory input with abstract design factors: technical limits; architectural design theory; graphic design; Human-Computer Interface principles; user psychographics; game design theory; project stakeholders' requirements. If these factors are not properly balanced, the product fails and the user will be left sitting in front of a screen, unhappily clicking buttons. If it succeeds, the user feels immersed in the experience of a heritage site visit.

Paper Saturday 13 December 2.15 pm – 2.30 pm	Visualising Time and Space for the Dictionary of Sydney Andrew Wilson

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The core aim of the Dictionary of Sydney Project, a Linkage partnership between the University of Sydney, the University of Technology, Sydney and the City of Sydney, is to deliver historical information in context within a sustainable digital environment. The project has implemented a sophisticated data model to store the historical data and deliver spatial and temporal visualisations of it. In its initial form as a web site, the project uses free and open-source technologies to deliver these visualisations. In addition the project has geo-referenced about 2000 historical maps of Sydney from public collections including the NSW State Library, the City of Sydney Archives, NSW State Records, the NSW Lands Department and the University of Sydney. As these are progressively rolled out they will provide unprecedented access to primary data about Sydney's past.

Paper Monday 14 December 9.00 am – 9.30 am	Change and Continuity in Ngarrindjeri *Ruwe* (Country): Understanding Riverine Lifeways and Coastal Influences in the Lower Murray Christopher Wilson

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Previous models of human life ways along the Lower Murray River have suggested that cultural changes throughout the mid-late Holocene are related to environmental and socio-economic factors (see Hale and Tindale 1930; Pretty 1986; Pardoe 1983). Although this has provided a basis for understanding the archaeology of the Lower Murray, much of this research has been based upon burial research and/or studies that examine subsistence in local populations with a specific research agenda. Furthermore, this region of the River Murray is central to Ngarrindjeri people as ruwe (land/body) and cultural knowledge associated with Ngurunderi the creation ancestor suggests long-term interconnectedness between riverine and coastal life ways. This paper will provide an overview of a locally specific case study of riverine life ways in the Lower Murray which extends from ca 8,000 BP – present and how this research builds upon our understanding of change and continuity in Ngarrindjeri ruwe. Preliminary results and interpretations from this research that will be discussed include: radiocarbon results; issues with dating freshwater mussel shell *Velesunio ambiguus* as well as a discussion about an apparent increase in riverine resource use evident from ca 4,500 BP. These results will be compared to previous models of occupation from the Coorong (see Luebbers 1978) as well as Ngarrindjeri knowledge (through Ngurunderi) which may provide evidence for coastal influences within the region.

Paper Monday 14 December 2.10 pm – 2.30 pm	‘Documenting Ourselves’: The Use of Film in Articulating the Complexities of Repatriation and Reburial in Ngarrindjeri Ruwe Christopher Wilson[1], Tom Trevorrow[2], David Wilson[3] and Albert Lovegrove Buckskin[3]

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This paper will discuss the development of a community initiated documentary about repatriation and reburial of Ngarrindjeri Old People (human remains) titled: *Return of the Ngarrindjeri.* In recent years, the Ngarrindjeri have been involved in several repatriation cases domestically (see Wilson 2005) and internationally (see Fforde 2004; Wilson 2005). The repatriation and reburial issue is an ongoing debate for which many museums and collecting institutions are now changing their attitudes and collection policies to enable the Old People to be returned back home. The return of more than 400 Ngarrindjeri Old People in recent years has been positive, however it is a long and time consuming process that requires ongoing support and assistance to ensure reburials are completed appropriately. In September 2006, the first of many Ngarrindjeri reburials were conducted in collaboration with researchers from Flinders University (which included an Indigenous Archaeology Field School) and the National Museum of Australia. What has become evident is that the use of film and media in this context has become a powerful tool for educating the wider community about the repatriation/reburial issue from a Ngarrindjeri perspective. As part of this paper, a seven minute ‘teaser’ highlighting the core components of this documentary will be screened for public viewing.

Paper Monday 14 December 2.30 pm – 2.45 pm	Connection and Continuation – Ngarrindjeri Caring for Country Management Planning within the Lower Lakes, South Australia

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The Ngarrindjeri Caring for Country Heritage Project (NCCHP) was initially developed to address issues relating to the drought crisis and its impact upon Ngarrindjeri Ruwe (country). The project is managed by the Ngarrindjeri Land and Progress Association Inc. (NLPA) and is aimed at developing long-term management planning through research (case studies), conservation and public education. This paper discusses one such recent case study focused on recording Ngarrindjeri cultural heritage around Waltowa Wetland, east of Lake Albert. This work resulted in several outcomes including recommendations for further research to help develop management and conservation planning for the area. This research is used as a specific example of *continued* Ngarrindjeri engagement in heritage protection through collaborative partnerships. Collaborative partnerships can provide a unique opportunity to contribute valuable knowledge to Ngarrindjeri history of an area and result in a better understanding of the *connection* Ngarrindjeri people have with their pasts and their Ruwe.

Paper Sunday 13 December 11.20 am – 11.40 am	Ngarinyin Cultural Transmission and 'Caring for our Country' Heather Winter

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'Heritage listing should not come with dispossession but with possession - land, economy and knowledge will be the currency of the future' (Bob Brown 2009). It is the knowledge of Indigenous cultures that captures this notion of 'currency.' David Mowaljarlai, in 1995, expressed his fears of cultural dispossession in similar terms: 'first they took our land, now they will take our culture'.

On 30 June 2008, the Federal Government's Natural Heritage Trust was superseded by the 'Caring for our Country' program. Embedded into the parameters of Indigenous engagement is an urgent desire to gather and store traditional ecological knowledge. Is this a short term remedy indicative of a legalistic, formalized and top down agreement structure? What the Caring for Country statement reflects is economic rationalization based on the 'potential' wealth of Indigenous cultural knowledge with a focus on 'capturing' knowledge as 'disappearance' is imminent. This urgency, whilst acknowledging 'intangible' heritage values, fails to address specific Ngarinyin structures needed to enable cultural transmission as opposed to outcomes measured by information retrieval. What cultural heritage discussions manage to escape are the culturally inescapable responsibilities integral to a complex system of family relationships reliant on oral transmission.

The complexities of cultural transition in maintaining custodianship, authorship, cultural governance and management of the Wanjina and Gwion rock art sites in the North West Kimberley already exists through the oral transmissions associated with painting. Through 'Mamaa The Untouchable Ones from Cave to Canvas', the translation of the cultural, social and religious laws governed by the Wanjina are translated through the elders transferring their memories onto canvas. What emerges in such creative spaces is change through practice; such governance should underwrite cultural heritage programs that address the North West Kimberley.

Paper Monday 14 December 2.50 pm – 3.10 pm	All Aboard: Longer Term Cultural Heritage Research and Management with the Wajarri of the Weld Range Vicky Winton and Viviene Brown

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The Wajarri know about their country and the archaeological sites it contains. The Weld Range, a series of ironstone ridges in the inland mid west region of Western Australia, is most famous for the Aboriginal ochre mine Wilgie Mia. More recently it is becoming known for its mineral deposits. Sinosteel Midwest Corporation Ltd's Weld Range project has provided the opportunity for the Wajarri and Eureka to conduct large scale archaeological survey work in the Weld Range. To date some 175 sites have been recorded to a basic site avoidance level. The density of sites, level of site integrity and variety of activities represented is a rich archaeological resource akin to that recorded in the inland Pilbara. The next stage is the comprehensive recording of nominated sites to provide cost effective analysis and reporting that enables the Proponent to apply for its required heritage approvals. In this paper, Eureka discusses the options for long-term cultural heritage research and management within the framework of gaining timely heritage approvals.

Poster	Technological Responses to the Submergence of Fossiliferous Chert Sources in the South West of Western Australia

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In the south west of Western Australia the stone tool record exhibits an unusual pattern involving the decline and disappearance of artefacts made from a distinctive type of fossiliferous chert, between 12,000 and 4,500 years BP. The sources of the fossiliferous chert are postulated to have been submerged by rising sea levels, which attained their present position around 6,500 years BP. Previous research identified the variation in the timing of the decline and disappearance of fossiliferous chert artefacts within the archaeological record. This research aimed to study the loss of fossiliferous chert in relation to new ideas on the influence of raw material on lithic assemblage variation. Analysis of the lithic material from the sites of Dunsborough Axe and Dunsborough Two and re-analysis of the lithic data available from the sites of Tunnel Cave and Devil's Lair suggested while there were common technological responses to changing access to fossiliferous chert sources, responses also varied between sites according to the site's function within the region, the local geological context of the site and archaeological sampling. These results suggest that influences of site function and the knapping properties of certain raw materials need to be incorporated into studies of lithic assemblages in the south west of Western Australia and the regional context of a site needs to become the focus of global studies into raw material availability as a component of lithic assemblage variation.

Paper Monday 14 December 11.20 am – 11.40 am	What Happens when a Landbridge becomes a Group of Islands? Duncan Wright

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The majority of Australia's offshore islands show a considerable shift coincident with their formation. In the majority of cases this involves a hiatus in human habitation for several thousand years (O'Connor 1992). On other islands occupation becomes sporadic (e.g. Kangaroo, Whitsundays, King, Hook, and Flinders islands) while fewer still evidence sustained settlement (e.g. Tasmania, Bathurst and Melville Islands). The latter scenario is often explained through island size and ecological diversity or proximity to a larger land mass (Jones 1976). Excavations on Mabuyag (Western Torres Strait) reveals continued settlement during a period of sea-level high-stand. This paper presents results from these excavations and examines human responses to islandisation in the Torres Strait.

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