



MACQUARIE
University

CACHE

CENTRE FOR ANCIENT CULTURAL HERITAGE AND ENVIRONMENT

Matters

E-ZINE 2020





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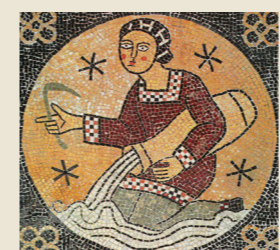
Further information about new projects, new people, and new events for 2021 can be found on our website:

<https://www.mq.edu.au/research/research-centres-groups-and-facilities/resilient-societies/centres/cache>

Magazine content and design by Alice McClymont unless otherwise specified.

Front cover: Dakhleh Oasis, Egypt. Credit: Fred Hardtke.

Opposite: The Pinnacles Desert, Nambung National Park, Western Australia. Credit: Tobias Keller.



Centre for
Ancient
Cultural
Heritage and
Environment

Director's report

Prof. Ronika Power

In a year of sudden and dramatic change for local, national and international communities, CACHE was challenged to rapidly adapt to new ways of supporting and producing research. Notwithstanding the significant impact to our planned activities for 2020 due to the COVID-19 global pandemic, I am proud of the extraordinary resilience and resourcefulness demonstrated by our members, affiliates, and Executive. Through their determination, CACHE members managed to uphold our Centre's standard of research excellence, even while facing profound disruption in every aspect of their academic and personal lives. I applaud their many successes and am delighted to present highlights of a year that was, quite literally, like no other.

Members' key achievements

First and foremost, congratulations to **Prof. Bronwen Neil** (History and Archaeology, MQ) for her secondment to the Australian Research Council for the role of Executive Director for Humanities and the Social Sciences in June 2020. I was honoured to succeed Bronwen as CACHE Centre Director in July 2020. We're indebted to Bronwen for her enormous efforts to establish the Centre, and wish her very well for her time in Canberra. Fortunately, Bronwen remains as both a Centre member and a member of the Advisory Board, so her skills, experience, and contributions are retained within our research community.

Congratulations to **Prof. Javier Álvarez-Mon** and **Dr Yasmina Wicks** (both History and Archaeology, MQ) for their appointment as Expert Examiners under the *Protection of Movable Cultural Heritage Act 1986* to advise the Australian Government, Collections and Cultural Heritage Branch (Office for the Arts) on foreign cultural property from the Near East entering Australia. To find out more about Yasmina's work, read her profile on page 7. International recognition also came to **Dr Gil Davis** (History and Archaeology, MQ) in the shape of an Invited Professorship with the *École normale supérieure de Lyon* from January–July 2021, to carry out work on the ongoing major European Research Council project 'Silver isotopes and the rise of money', to **Prof. Ian Worthington** (History and Archaeology, MQ), who was admitted as a Fellow of the Society of Antiquaries of London, and to **A/Prof. Paul McKechnie** (History and Archaeology, MQ), who was admitted as a Fellow of the Royal Society. We are fortunate indeed to have these global experts amongst our membership.



Special congratulations are also due to **A/Prof. Caillan Davenport** (History and Archaeology, MQ) for receiving the Royal Historical Society Gladstone History Book Prize 2020 and to **A/Prof. Eva Anagnostou-Laoutides** (History and Archaeology, MQ) for her award of a Greek Diaspora Fellowship, funded by the Institute of International Education and supported by the Stavros Niarchos Foundation and the Fulbright Foundation in Greece. More details on these esteemed awards can be found on page 5.

Despite the interruptions, uncertainty, and isolation of 2020, research continued apace across our three themes (*Humans in their Ancient Urban and Natural Environments*; *Receptions of Ancient Cultural Heritage*; *Ancient Models of Leadership: Learning from the Past*) resulting in over 95 publications through the year; see our highlights on page 4. Congratulations to all our members for their outstanding outcomes. Several CACHE members and their teams were also successful in securing major external funding for their research projects; see page 5 for more details of these grants. We'd also like to acknowledge our members who submitted excellent external funding applications in 2020 that didn't go through despite their enormous investments of time and effort. Better luck next time, comrades!

In CACHE, we acknowledge that research and teaching are inseparable elements of our members' enterprise, so it is with great pride and pleasure that we congratulate our colleagues who were nominated for prestigious teaching awards through the year, **A/Profs Lea Beness** and **Linda Evans** (both History and Archaeology, MQ). See page 5 for more details of their nominations.

CACHE-Funded Projects

Sadly, CACHE was not exempt from the heavy impact of COVID-19 on institutions across the Australian higher education sector. Lockdowns, travel bans, and on-campus restrictions may have dismantled our ambitious plans for 2020, but they did not dampen our appetite to pivot, pursue, and promote our research (see below for more details on our Outreach & Engagement). A key achievement included the adaptation to host a major online symposium in November, ***Humans in Deserts – Stories of Exploitation and Survival***, convened by CACHE ECR member, **Dr Frederick Hardtke** (History and Archaeology, MQ). The event featured high-profile international and local speakers across all career stages and was extremely well-attended. The event's success has established a model for virtual conference attendance and ushered in a 'new normal' benchmark for hosting more accessible events beyond the pandemic. For more details, see pages 8–9 for a full report.

Although several of our other events were not able to be hosted in 2020, their postponement into 2021 ensures a robust program for this year. Keep an eye on our website and social media accounts for updates on the Crises of Leadership workshop (CIs **A/Prof. Eva Anagnostou-Laoutides**, Dr Peter Edwell, **Prof. Bronwen Neil**, **Dr Matthew O'Farrell**, see page 17), the Living Digital Heritage conference & exhibition (CI **Dr Frederick Hardtke**), the (Re)Imagining the Past symposium (CIs **Prof. Malcolm Choat**, **Dr Rachel Yuen-Collingridge**), and the Enabling Healthier Gomeri/Kamilaroi Country project (CIs **Uncle Phil Duncan**, **Dr Emily O'Gorman**, see page 16).

CACHE Early Career Researchers

The engagement and achievements of our CACHE ECRs were a particularly bright spot through 2020. In April, we were delighted to welcome **Dr Sophia Aharonovich** (History and Archaeology, MQ) as Postdoctoral Research Fellow in the Archaeology of Ancient Israel, externally-funded by the Education Heritage Foundation. Sophia has made a great start to her three-year fellowship and provides detailed insights into her project and progress on pages 14–15. We were also thrilled to welcome our first Visiting Postdoctoral Fellow, **Dr Emlyn Dodd**, who spent a productive month working in our CACHE Research Room, situated within the new Macquarie University Arts precinct. During his Fellowship, Emlyn drafted and submitted an article for the journal *Mediterranean Archaeology*, as well as an editorial piece for *The Conversation*. To read more about Emlyn's work, see his profile on page 6.

Demonstrating the power of ECR mentoring and collaboration, **Drs Sophia Aharonovich** and **Emlyn Dodd** successfully delivered a co-convened session entitled 'From Field to Table' at the Mediterranean Archaeology Australasian Research Community (MAARC) conference, held online in January 2021. Additionally, **Dr Sophia Aharonovich** and CACHE ECR members **Drs Yasmina Wicks**

and **Anna-Latifa Mourad** were the invited featured panellists for a special online mentoring session for Ancient History HDR students on postdoctoral fellowships in November 2020. The panel discussed their careers to date, how to obtain postdoctoral funding, and what postdoc life is really like.

Outreach & engagement

Sharing our research and impact with our local, national, and international communities, CACHE members, HDRs and ECRs featured in over 50 high profile public outreach and media appearances throughout 2020, including major free-to-air television and radio news media, invited keynotes, media collaborations, online publications, and social media releases in Australia, Israel, Greece, and the UK.

Acknowledgements

I'd like to take this opportunity to extend my thanks and admiration to our members and affiliates of all career stages for their contributions through a truly challenging year. The highlights presented in this issue are only the smallest reflection of their tireless pursuit of research excellence, made even more remarkable this year under the prevailing 'special circumstances'. Thanks must also go to the offices of the Deputy Vice-Chancellor Research **Prof. Sakkie Pretorius**, and the Pro Vice Chancellor (Research Performance) **Prof. Amanda Barnier**, for their continued support of our Centre's objectives. CACHE very much appreciated their sensitivity and understanding as our great plans for 2020 dissolved in the wake of COVID-19. Special thanks to our Deputy Directors, **Drs Emilie Ens** (Earth and Environmental Sciences, MQ) and **Karin Sowada** (History and Archaeology, MQ), and to our Executive Committee for their support and resilience, and especially for the generous donation of their time during a year when it was their scarcest commodity. Final heartfelt thanks are due to our Centre Manager, **Dr Alice McClymont**, for her unparalleled organisation, seemingly infinite skillset, and inextinguishable dedication to CACHE's mission. We wouldn't have made it through the year without her.

Contact Us

Thanks for taking the time to read the 2020 edition of *CACHE Matters*. This e-Zine is only a snapshot of all the fascinating people, projects, and ideas involved in our research centre. If our work aligns with your own and you'd like to get involved in our Centre, please contact our Director, Deputy Directors, or Centre Manager via cache@mq.edu.au. Please also contact us if you would like to explore the possibilities of collaborative research funding, industry partnerships, or are interested in developing an event that builds research capacity in ancient cultural heritage and environment studies. To stay abreast of our news, activities and opportunities, please stay tuned to our [website](#) and follow us on [Twitter](#) and [Facebook](#).

Left: Prof. Ronika Power. Credit: Joanne Stephan, Macquarie University.

Publication snapshot

Research by CACHE members resulted in over 95 publications between January and November 2020

Books

Ken Sheedy and Gil Davis

Editors, *Metallurgy in numismatics 6. Mines, metals and money: ancient world studies in science, archaeology and history*, Royal Numismatic Society Special Publications 56 (London: Royal Numismatic Society, 2020).

Yann Tristant

L'occupation humaine dans le delta du Nil aux Ve et IVe millénaires: approche géoarchéologique à partir de la région de Samara (delta oriental), Bibliothèque d'étude 174 (Cairo: Institut français d'archéologie orientale, 2020).

Ian Worthington

Athens after empire: a history from Alexander the Great to the Emperor Hadrian (New York: Oxford University Press, 2020).

Book chapters

Meaghan McEvoy

The jelly-fish emperor: the emperor Arcadius and imperial leadership in the late fourth century, 395–408AD, in Erika Manders and Daniëlle Slotjes (eds), *Leadership, ideology and crowds in the Roman empire of the fourth century AD*, Heidelberg Althistorische Beiträge und Epigraphische Studien 62 (Stuttgart: Franz Steiner Verlag).

Karin Sowada

Perspectives on Egypt in the Southern Levant in light of the High Early Bronze Age Chronology, in Suzanne Richard (ed.), *New horizons in the study of the Early Bronze III and Early Bronze IV of the Levant* (University Park, PA: Eisenbrauns, 2020), 149–168.

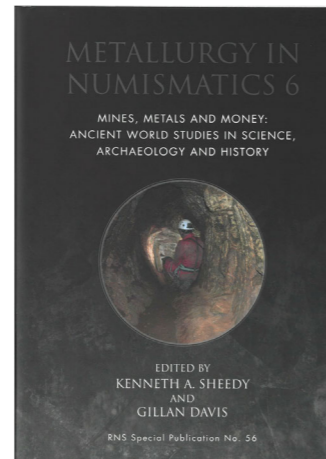
Peter Keegan

Colon(ial)izing Fulvia: (re)presenting the military woman in history, fiction, and art, in Filippo Carlà-Uhink and Anja Wieber (eds), *Orientalism and the reception of powerful women from the ancient world* (London & New York: Bloomsbury, 2020), 103–122, DOI [10.5040/9781350077416.ch-007](https://doi.org/10.5040/9781350077416.ch-007).

Journal articles

Gil Davis, Damian Gore, and Ken Sheedy

with Francis Albarède, Separating silver sources of Archaic Athenian coinage by comprehensive compositional analyses, *Journal of Archaeological Science* 114 (2020), 1–8, DOI [10.1016/j.jas.2019.105068](https://doi.org/10.1016/j.jas.2019.105068).



Emilie Ens

with Michelle McKemey, Yugul Mangi Rangers, Oliver Costello, and Nick Reid, Indigenous knowledge and seasonal calendar inform adaptive savanna burning in northern Australia, *Sustainability* 12:3 (2020), 995, DOI [10.3390/su12030995](https://doi.org/10.3390/su12030995).

Linda Evans and Fred Hardtke

with Emily Corbin and Wouter Claes, Camouflaged chameleons: a new discovery at the Egyptian site of el-Hosh, *Archaeological and Anthropological Sciences* 12:158 (2020), 1–9, DOI [10.1007/s12520-020-01125-y](https://doi.org/10.1007/s12520-020-01125-y).

Damian Gore and Ronika Power

with Michelle Whitford, Simon Wyatt-Spratt, Mattias Johnsson, Michael Rampe, Candace Richards, and Michael Withford, Assessing the standardisation of Egyptian shabti manufacture via morphology and elemental analyses, *Journal of Archaeological Science: Reports* 33 (2020), DOI [10.1016/j.jasrep.2020.102541](https://doi.org/10.1016/j.jasrep.2020.102541).

Kyle Keimer

The historical geography of 1 Kings 9:11–14, *Palestine Exploration Quarterly* 152:3 (2020), 186–206, DOI [10.1080/00310328.2020.1721188](https://doi.org/10.1080/00310328.2020.1721188).

Ray Laurence

with Michael Worthing, Lloyd Bosworth, M. Papandrea, Eric Poehler, and Steven Ellis, HHpXRF study of recent zinc and lead pollution on lava stepping stones from Pompeii: tourist footfall, tyre dust and leaded petrol, *Archaeometry* 62:5 (2020), 1042–1066, DOI [10.1111/arc.12570](https://doi.org/10.1111/arc.12570).

Anna-Latifa Mourad

Foreigners at Beni Hassan: evidence from the Tomb of Khnumhotep I (No. 14), *Bulletin of the American Schools of Oriental Research* 384 (2020), DOI [10.1086/710528](https://doi.org/10.1086/710528).

Emily O'Gorman

with Andrea Gaynor, More-than-human-histories, *Environmental History* 25.4 (2020), 711–735, DOI [10.1093/envhis/ema027](https://doi.org/10.1093/envhis/ema027).

Media

Tim Ralph

with Zacchary Larkin and Stephen Tooth, Australia's inland rivers are the pulse of the outback. By 2070, they'll be unrecognisable, *The Conversation* (2020) (republished in *Australian Geographic*).

Funding & excellence

CACHE members received internal and external funding and recognition for their research in 2020

Grants

Major external funding was awarded to four projects led by CACHE members across our research themes. **Dr Emilie Ens**, **Prof. Damian Gore**, and **Dr. Tim Ralph**, along with Prof. Neil Saintilan, Prof. Andrew Skidmore, Daniel Sloane (all Earth and Environmental Sciences, MQ), Jimmy Yumutjin Wunungmurra (Yirralka Rangers), and David Preece (Laynhapuy Indigenous Protected Area) received an ARC Linkage Project grant of \$507,000 for their project 'Can coastal floodplains of north Australia survive ferals and rising seas?' (2020–2023). Through a collaborative approach with the Indigenous Yirralka Rangers in north eastern Arnhem Land, this project aims to disentangle the effects of feral ungulates (buffalo and pig) and sea level rise on coastal floodplain vegetation, soils, and hydrology using Yolŋu and Western science. **Tim Ralph** received a further ARC Linkage Project grant of \$600,000, along with Prof. Kirstie Fryirs (Earth and Environmental Sciences, MQ) and Prof. Michelle Leishman (Biological Sciences, MQ), for the project 'Working with recovery: Future proofing our rivers against floods and droughts' (2020–2023), which investigates environmental recovery processes.

An ARC Discovery Project grant of \$141,236 was awarded to **Prof. Ian Worthington** (History and Archaeology, MQ) and A/Prof. David Pritchard (UQueensland) for the project "'From where the fine warships come": Democratic Athens at War'. This research will explore the military aspect of classical – and contemporary – democracy. This joins another ARC Discovery Project awarded in the same round and reported in the last issue of *CACHE Matters*, 'Crises of leadership in the Eastern Roman empire (250–1000 CE)' (2020–2022), led by A/Prof. **Eva Anagnostou-Laoutides**, Dr Peter Edwell, **Prof. Bronwen Neil** (all History and Archaeology, MQ), Prof. Theodore de Bruyn (UOttawa), and Dr Chris Bishop (ANU).

Fellowships & appointments

Eva Anagnostou-Laoutides was awarded a Greek Diaspora Fellowship, funded by the Institute of International Education and supported by the Stavros Niarchos Foundation and the Fullbright Foundation in Greece. ECR Affiliate **Dr Emlyn Dodd** (History and Archaeology, MQ) received an Australian Academy of the Humanities Travelling Fellowship to

continue his research into Roman oil and wine production. **Dr Gil Davis** (History and Archaeology, MQ) was appointed to an Invited Professorship with École normale supérieure de Lyon from January–July 2021, to carry out work on the ongoing major European Research Council project 'Silver isotopes and the rise of money'. Previous *CACHE* Director **Bronwen Neil** was seconded to the Australian Research Council, taking up the role of Executive Director for Humanities and the Social Sciences. A/Prof. **Paul McKechnie** (History and Archaeology, MQ) was admitted as a Fellow of the Royal Historical Society and **Prof. Ian Worthington** was admitted as a Fellow of the Society of Antiquaries of London.

Awards & prizes

A/Prof. **Caillan Davenport** (History and Archaeology, MQ) received the 2020 Royal Historical Society Gladstone History Book Prize for his monograph *A history of the Roman equestrian order* (Cambridge: Cambridge University Press, 2019). A/Prof. **Lea Beness** and A/Prof. **Linda Evans** (both History and Archaeology, MQ) were finalists for Macquarie University's Vice-Chancellor's Learning and Teaching Awards. **Lea Beness** was nominated for a Teaching Excellence Award and **Linda Evans** was nominated for an Educational Leader Award with A/Prof. Tanya Evans (History and Archaeology, MQ) for their development of the PACE unit Cultural Heritage and Public History.

Promotions

Several *CACHE* members from the Department of History and Archaeology, MQ received promotions that came into effect in 2021: **Peter Keegan** and *CACHE* Director **Ronika Power** were promoted to the level of Professor; **Caillan Davenport** and **Linda Evans** were promoted to the level of Associate Professor; and **Susan Lupack** and **Meaghan McEvoy** were promoted to the level of Senior Lecturer.



Left: A/Prof. Caillan Davenport won the 2020 Royal Historical Society Gladstone History Book Prize for his monograph *A history of the Roman equestrian order*. Credit: Meaghan McEvoy.

ECR profiles

Spotlight on the work of two of our early career researchers

Emlyn Dodd

Dr Emlyn Dodd joined CACHE in 2020 as an ECR Affiliate and our first Visiting Postdoctoral Fellow. His fellowship project 'Viticulture and oleiculture of the Roman and Late Antique Cyclades: a study on knowledge networks, agricultural expertise and technological diffusion' continued his doctoral and postdoctoral investigation into wine and oil production across the ancient Mediterranean. Preliminary results from this study have been published in the 2021 volume of the journal *Mediterranean Archaeology*.

Emlyn received his PhD from Macquarie University in 2018. He was the resident Macquarie-Gale Scholar at the British School at Rome (BSR) in 2015–2016, and Greece Fellow at the Australian Archaeological Institute at Athens (AAIA) in 2019–2020. In 2020, he also received an Australian Academy of the Humanities Travelling Fellowship, British School at Athens Richard Bradford McConnell Fund for Landscape Studies Award, and won the Macquarie-Gale Graeco-Roman Travelling Scholarship. He has participated in archaeological fieldwork projects in Greece with the AAIA, in Turkey with the University of Nebraska-Lincoln, in Italy with Macquarie University and the BSR, and will soon be joining the University of Warsaw collaborating on a new interdisciplinary project in Tunisia.

Emlyn's dissertation was recently published as the monograph *Roman and Late Antique wine production in the Eastern Mediterranean*, Archaeopress Roman Archaeology (Oxford: Archaeopress, 2020) and he has authored several journal articles focusing on aspects of ancient viticulture. In January 2020, Emlyn co-convened the conference session 'From field to table' at the inaugural meeting of the Mediterranean Archaeology Australasian Research Community (MAARC) with CACHE Postdoctoral Research Fellow Dr Sophia Aharonovich. He will be taking up the position of Assistant Director for Archaeology at the BSR in 2021 and commencing new fieldwork in central Italy, investigating production of the famed Roman *Falernian*, *Setian*, and *Caecuban* wines.



Above: Dr Emlyn Dodd at the British School at Rome. Credit: Antonio Palmieri.
Below: Dr Emlyn Dodd recording a wine press vat at Antiochia ad Cragum, Turkey. Credit: Emlyn Dodd.



Yasmina Wicks

Dr Yasmina Wicks joined the Department of Ancient History, now the Department of History and Archaeology, in 2020 as recipient of a Macquarie University Research Fellowship. Her project 'Villages to empire: 4,000 years of death and society in Elam (4500–525 BCE)' explores the cultural development of this ancient Near Eastern civilisation, located broadly in the modern-day region of southwest Iran, through the lens of its funerary record.

Yasmina's work follows on from her doctoral studies at the University of Sydney, completed in 2017. During her candidature, she was awarded an Australian Government Endeavour Research Fellowship to study at the University of Naples 'L'Orientale'. In 2019, she joined a multi-institutional research project on ancient Near Eastern funerary practices, conducted by 'L'Orientale', Sapienza Università di Roma, and Istituto Italiano per l'Africa e l'Oriente, before taking up a visiting postdoctoral fellowship at Université catholique de Louvain, exploring children and childhood in Elam.

Yasmina is growing a prolific publication record. Both her honours thesis and doctoral dissertation have been published as monographs: *Bronze 'bathtub' coffins in the context of 8th–6th century B.C.E. Babylonian, Assyrian and Elamite funerary practices* (Oxford: Archaeopress, 2015) and *Profiling death: Neo-Elamite mortuary practices, afterlife beliefs, and entanglements with ancestors*, Culture and History of the Ancient Near East 98 (Leiden: Brill, 2017). She also co-edited the volume *The Elamite world*, Routledge Worlds (London & New York: Routledge, 2019) with Gian Pietro Basello (UNaples 'L'Orientale') and fellow CACHE member Prof. Javier Álvarez-Mon (History and Archaeology, MQ). Additionally, she has produced a number of articles and chapters covering a range of topics relating to Elamite



Above: Khuzestan Province, Iran. Credit: Mohammad Asadi.
Below: Dr Yasmina Wicks with the relief of Hanni of Ayapir, Kul-e Farah, Izeh Valley, Khuzestan Province, Iran. Credit: Yasmina Wicks.

history, society, material culture, and art. Yasmina worked with Javier Álvarez-Mon and Dr Brian Ballsun-Stanton (Arts, MQ) to curate the online exhibit 'Hanni of Ayapir (c. 600 BC)' for Google Arts & Culture. She is also an invited International Committee Member and Reviewer for the Centre national de la recherche scientifique journal *Abstracta Iranica*. Last year, Yasmina was appointed as an Expert Examiner for the Collections and Cultural Heritage branch of the Australian Government Office for the Arts, to advise on foreign cultural property from the Near East entering Australia.

Events

As our planned program of activities for 2020 was impacted by the global pandemic, CACHE was able to make the transition into online event hosting with an interdisciplinary symposium on an aspect of environmental history

Humans in Deserts – Stories of Exploitation and Survival (7–8 November)

by Alice McClymont and Fred Hardtke

Originally planned for May 2020 on campus but postponed due to the necessary COVID-19 restrictions, the symposium Humans in Deserts – Stories of Exploitation and Survival went ahead in November as CACHE's first fully online event.

Over two days, thirteen local and international speakers from different career stages came together over Zoom to discuss human survival, adaptation, and exploitation of arid environments across multiple temporal and geographic contexts. The symposium was conceived and convened by **Dr Fred Hardtke** (History and Archaeology, MQ), currently the director of a Belgian-Australian archaeological mission documenting rock art at El Hosh, Egypt. The theme of the event was developed along three lines of enquiry: 1) physical and functional considerations of humans living in and using deserts; 2) the role of art, tradition, and belief in shaping and understanding interactions with arid landscapes; and 3) political dimensions of controlling and exploiting these environments.

The symposium opened with the keynote paper 'Modes of adaptation: The long history of foraging societies in Australia's drylands' by Prof. Mike Smith AM (National Museum of Australia), an esteemed desert archaeologist. His paper outlined the broad history of socio-economic adaptation to Australian deserts by foraging societies, emphasising the great need to support and engage with Indigenous knowledge and practices. This message was further promoted by Dr Michael Westaway (UQueensland), who presented the initial results of archaeological research undertaken with the Mithaka Aboriginal Corporation to investigate Indigenous trade, food production, and settlements in Channel Country, Central Australia.



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”

Looking further afield, several papers focused on the desert environment of ancient and modern Egypt. Undergraduate student Ginger-Rose Harrington and CACHE ECR Affiliate **Dr John Burn** (both History and Archaeology, MQ) addressed the potential environmental changes linked to the end of the Old Kingdom period. Ms Harrington advocated for the use of psychological theory to understand reactions to resource unavailability during long-term environmental hardship, while Dr Burn presented the results of his doctoral research into the ecological effects of drought and how this may have been reflected in tomb decoration. Prof. John Darnell (Yale) explored the religiosity of the desert in ancient Egypt and its conception as a sacred space as revealed through rock art and rock inscriptions. **Dr Susanne Binder** (History and Archaeology, MQ) moved forward in time, presenting the journey of 19th century traveller Max Weidenbach through the Egyptian desert as recorded in his diary, demonstrating how legacy data can inform the work of current scholars in understanding changing landscapes.

The region of South Africa was explored by both A/Prof. Alex Mackay (UWollongong) and Dr Justin Pargeter (NYU), who provided case studies demonstrating the importance of including arid sites in the reconstruction of early human behaviour. A/Prof. Mackay discussed archaeological findings such as ornaments and tools from Varsche Rivier 003 that suggest this Middle Stone Age site was a source of technological innovation. Dr Pargeter presented data from the Late Glacial deposits at Boomplaas Cave to test the

hypothesis that population size predicated technological complexity, arguing that there was no correlation in this instance.

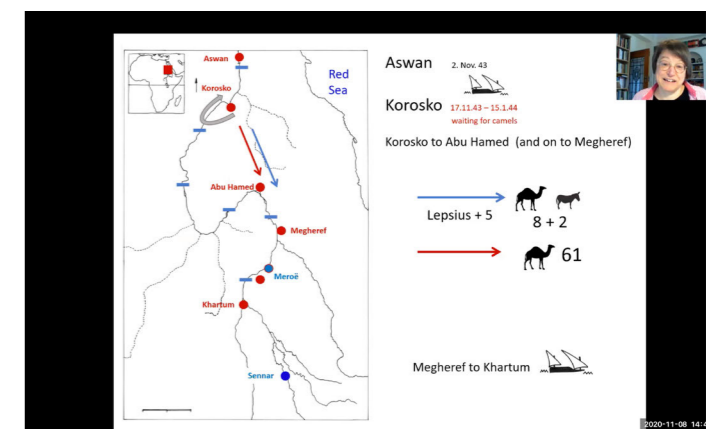
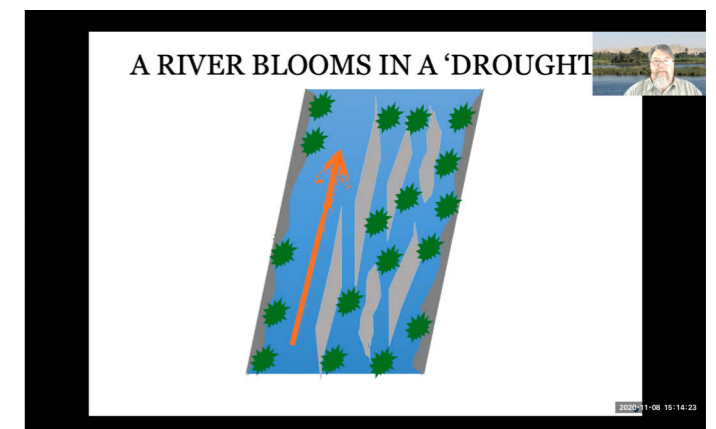
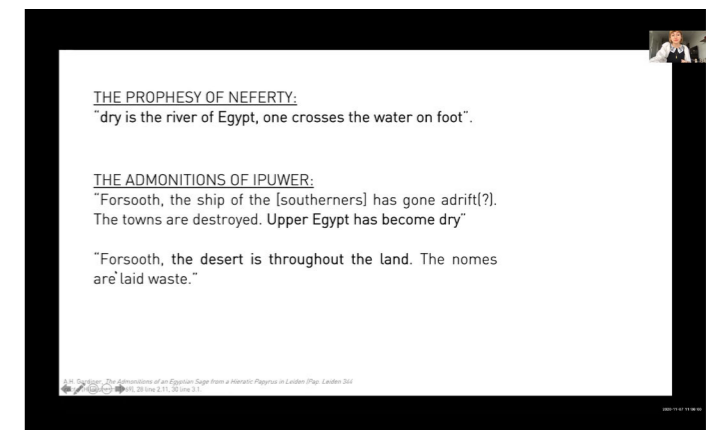
Papers on the region of southeast Arabia explored the strategic use of this area by ancient populations. Prof. Lloyd Weeks (UNE) discussed the evidence for seasonal occupation of desert sites in the face of environmental deterioration, focusing on the long-term intermittent use of the Bronze Age–Iron Age site of Saruq al-Hadid, Dubai. Joseph Lehner (USyd) presented findings from recent work at Wadi el-Raki, Oman that reveal the adaptability of copper production to a desert setting from the Bronze Age–Early Islamic Period and the management of its environmental impact.

Papers by Prof. Alison Betts (USyd) and A/Prof. Paul Hesse (Earth and Environmental Sciences, MQ) explored cases of large-scale, diachronic human–environment interaction in arid settings. Prof. Betts discussed the evidence for communal hunts across the Asian Steppes from prehistory to the early 20th century that has been revealed largely through satellite imagery, emphasising the sophisticated approaches and social and ritual importance of such activities. A/Prof. Hesse reported on his project to capture data on environmental change and land management practices in the highlands of the Southern Andes in Argentina across the last 10,000 years, with a view to informing future practice.

Each day concluded with a networking session, where speakers and audience members took part in an open conversation about themes raised in the day's presentations. The topic of arid environments encouraged a broad, interdisciplinary discussion that highlighted a number of common goals and concerns – cultural, theoretical, and methodological. With this in mind, a proposal was made at the end of the symposium to consider the establishment of an arid past environments research network. We look forward to sharing further developments about this proposed network in the near future!

“
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”

Opposite: Dr Fred Hardtke presenting the opening address on the first day of the symposium Humans in Deserts – Stories of Survival and Exploitation.



Above, top: Macquarie University student Ginger-Rose Harrington discussing commodity theory in her paper 'Is the price really what you pay? The psychology of resource unavailability during the First Intermediate Period'.

Above, middle: CACHE ECR Affiliate Dr John Burn presents his doctoral research on ancient Egyptian environmental change in his paper 'The A.R.I.D. hypothesis: A river in drought'.

Above, bottom: CACHE member Dr Susanne Binder describes the itinerary of a 19th century desert journey in her paper 'From the Nile Valley into the deserts: Max Weidenbach's diary as it documents the Lepsius Expedition (1842–1845)'.

Research projects

Find out what some CACHE members have been researching

Greek Villa Virtual Reality Project

by Alice McClymont and Susan Lupack

In 2019, CACHE members Dr Susan Lupack and Prof. Bronwen Neil (both History and Archaeology, MQ) joined with Prof. Deborah Richards (Computing Sciences, MQ), A/Prof. Ayse Bilgin (Mathematics and Statistics, MQ), and Meredith Porte (Computing Sciences, MQ) to develop a virtual reality (VR) teaching tool for university-level ancient history students.

The team designed and created an interactive environment modelled on the late fifth-century BCE Villa of Good Fortune at Olynthos, Greece, which is filled with historical artefacts and characters that help to bring this ancient society and its culture to life. Participants of the VR experience take on the avatar of a fifteen-year-old girl named Leila, who is coming to the villa for the first time to work as a slave. They can then explore the household, engage with objects and daily activities, and have dialogues with other characters including the mistress of the household and the head female and male slaves.

One of the purposes of this interdisciplinary project was to investigate the effectiveness of VR as an immersive learning technology in comparison with traditional lecture and text-based models of teaching. The experience was first presented in late 2019 to students of the AHIS2302: Archaeology and Society unit, in collaboration with the Macquarie University Simulation Hub. The cohort was divided into two groups, one exploring the VR villa and the other receiving the same historical information through a lecture and Powerpoint slides during a tutorial class. The effect on the students of each learning mode was captured through a post-class test, which included questions designed to test for a differential in factual knowledge and for a potential variance in the students' empathetic reactions to the lived experiences of the inhabitants of the villa. The study will help to determine the relationship between immersive, first-person point of view teaching methods and student learning. An article focusing on the results of the study is currently being prepared for publication.

The other main purpose of creating the virtual villa is to provide an exciting and engaging teaching tool that can be used and improved upon for future students studying ancient Greek archaeology. The VR experience provides a very immediate and powerful opportunity to learn about many aspects of ancient Greek society, including its hierarchical structure, gender relations, the situations of slaves, industrial and agricultural production, cult practice, and religious beliefs. The team are considering ways to make the experience more widely available. Take a look at some of the interiors of the different rooms and the characters that were produced for the villa!



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Above, top: The household's daughter Glauke weaving at the loom. Credit: Deborah Richards, Susan Lupack, Ayse Bilgin, Bronwen Neil, and Meredith Porte.

Opposite: The andron, or dining room, of the Greek villa, with the head slave Adonis. Credit: Deborah Richards, Susan Lupack, Ayse Bilgin, Bronwen Neil, and Meredith Porte.

Above, bottom: The kitchen with the head female slave, Elodie. Credit: Deborah Richards, Susan Lupack, Ayse Bilgin, Bronwen Neil, and Meredith Porte.

Can tropical coastal floodplains in northern Australia survive feral ungulates and rising seas?

by Emilie Ens and Alice McClymont

The Tropical Coastal Floodplains are an ecologically and culturally significant feature of northern Australian landscapes. However, in recent decades, feral ungulates and sea level rise are having visible effects on these ecosystems, which is of concern to the Traditional Owners across the north. An ARC Linkage Project, led by **Dr Emilie Ens**, **Prof. Damian Gore**, **Dr. Tim Ralph**, Prof. Neil Saintilan, Prof. Andrew Skidmore, and PhD student Daniel Sloane (all Earth and Environmental Sciences, MQ) together with Jimmy Yumutjin Wunungmurra (Yirralka Rangers) and David Preece (Laynhapuy Indigenous Protected Area), seeks to integrate Aboriginal knowledge and Western scientific data to better understand and manage these changes.

The project team are focusing on the Laynhapuy Indigenous Protected Area (IPA) in north-eastern Arnhem Land. The area is managed by the Yirralka Rangers who, along with other Traditional Owners and scientists, have observed considerable decline to the floodplains, such as the dieback of *Melaleuca* forests and the encroachment of mangroves. Some of these concerns have been detailed

in recent publications of the research team, led by Daniel Sloane (Sloane et al. 2019, Sloane et al. 2021). This decline is believed to be caused by the movement of feral ungulates (namely buffalo and pig) and the climate change-induced rise in sea level, which act together to remove vegetation, erode soil, and drive saltwater inland. Not only do these processes impact the environmental stability of the floodplains but they also have cultural implications for local Aboriginal communities.

The primary aim of the project is to determine whether the removal of feral buffalo and pigs will reduce or slow the known and predicted effects of climate change, so that the Yirralka Rangers can implement appropriate land management strategies. The two-way training approach of the investigation will bring the knowledge and techniques of the Laynhapuy IPA Traditional Owners and Yirralka Rangers together with those of scientists, through a number of steps.

Firstly, through interviews and group workshops with local leaders, the project will record local Yolŋu observations about environmental changes as well as the cultural significance of the floodplains, including their use as sacred sites and as a source for bush food and medicine. This will ensure that Aboriginal values and management priorities are centralised throughout the research and decision-making processes. Then, using the Gurrumuru

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The outcome of this cross-cultural science will be to develop a regional management plan that will enhance the resilience of the floodplains to climate change and also establish a best practice approach relevant to other coastal landscapes in northern Australia facing similar problems.
 ”



floodplain as an exemplar, the team will collate historical and new quantitative data acquired from techniques such as satellite imagery, sediment cores, monitoring wells, exclusion plots, and channel mapping, in order to analyse changes in vegetation, soil chemistry, and hydrology. This data will be used to identify hotspots of eco-cultural concern and model future floodplain dynamics across the Laynhapuy IPA.

The outcome of this cross-cultural science will be to develop a regional management plan that will enhance the resilience of the floodplains to climate change and also establish a best practice approach relevant to other coastal landscapes in northern Australia facing similar problems.

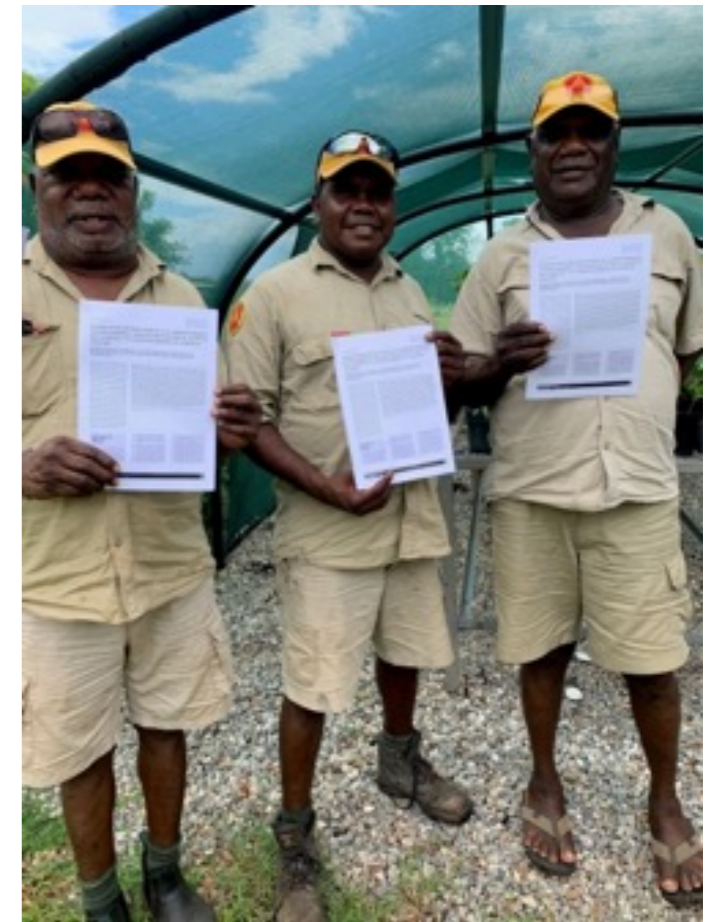
Sloane, D. R., E. Ens, J. Wunungmurra, A. Falk, G. Marika, M. Maymuru, G. Towler, D. Preece, and the Yirralka Rangers (2019), Western and Indigenous knowledge converge to explain *Melaleuca* forest dieback on Aboriginal land in northern Australia, *Marine and Freshwater Research* 70:1, 125–139, DOI [10.1071/MF18009](https://doi.org/10.1071/MF18009).

Sloane, D. R., E. Ens, Y. Wunungmurra, Y. Gumana, B. Wunungmurra, M. Wirrpanda, G. Towler, D. Preece, and the Yirralka Rangers (2021), Lessons from old fenced plots: eco-cultural impacts of feral ungulates and potential decline in sea-level rise resilience of coastal floodplains in northern Australia, *Ecological Management & Restoration*, DOI [10.1111/emr.12464](https://doi.org/10.1111/emr.12464).



Opposite, top: Animal tracks leading into an incised channel in a previously flat floodplain indicate changing environmental dynamics. Credit: Emilie Ens.

Opposite, bottom: Declining health of coastal *Melaleuca* forest in the Laynhapuy IPA, caused by saltwater intrusion. Credit: Daniel Sloane. Above, left: A 5x5m fenced exclusion plot used to compare the impact of feral ungulates on soil erosion and chemistry. Credit: Emilie Ens.



Above, top right: Banygada “Brendan” Wunungmurra, Daniel Sloane, Goninyal Gumana and (out of frame, right) Darren Wanambi undertaking elevation assessments. Credit: Shane Wunungmurra.

Above, bottom right: Bandibandi Wuningmurra, Yinimala Gumana, and Lirripiya Mununggurr displaying the paper ‘Lessons from old fenced plots’. This paper was recently published by the team that recorded local Yolŋu perceptions of feral ungulates on floodplains and observations of decade long fenced plots, which combined with Western science showed that feral ungulates are reducing plant diversity and bush tucker abundance, and are likely to be causing floodplain erosion. Credit: Sarah Kemp.

CACHE Postdoctoral Research Fellowship in the Archaeology of Ancient Israel

Dr Sophia Aharonovich (History and Archaeology, MQ) joined CACHE in April 2020 as Postdoctoral Research Fellow in the Archaeology of Ancient Israel. Her fellowship is supported for three years by the Education Heritage Fund. Sophia's research focuses on the analysis of organic material from archaeological sites, in particular pollen grains and phytoliths, in order to reconstruct environmental conditions, plant remains, and human activity.

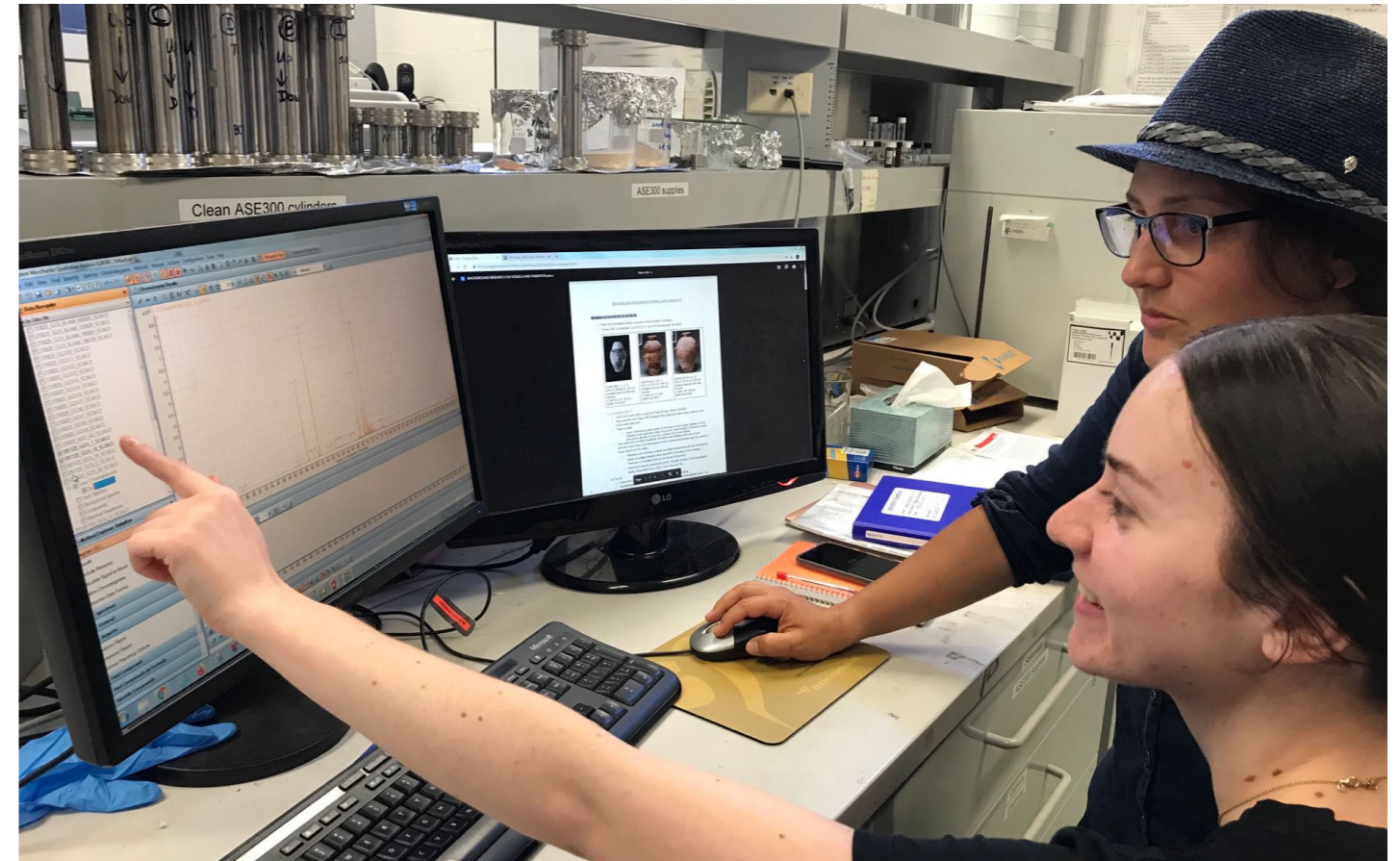
Since commencing her fellowship, Sophia has worked primarily with material from the Iron Age (12th–10th centuries BCE) settlement site of Khirbet el-Rai, Israel. A team from Macquarie University, led by Dr Kyle Keimer (History and Archaeology, MQ), excavated this site from 2015–2020 in partnership with Professor Yossef Garfinkel (Hebrew University of Jerusalem) and Saar Ganor (Israel Antiquities Authority). The archaeological remains, history of occupation, and geographic context of Khirbet el-Rai suggested to the excavators that the site is equivalent to the city of Ziklag referenced in the biblical record in connection to David, and the wealth of material uncovered presents an important source of information for Iron Age Levantine society.

During the 2019 and 2020 seasons, Sophia ran an on-site laboratory (generously funded by the Wakil family), working with students to undertake real-time chemical analysis of soil and residues. This work now continues at Macquarie University, where Sophia leads a teaching laboratory to study samples taken from storage rooms,



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burned silos, and pottery containers found at Khirbet el-Rai. These investigations have shed light on the daily life and activities of the inhabitants. Sophia has been able to identify details such as which plants were consumed or used for textile production and where activities like cooking and food storage took place, information that helps to culturally differentiate between the Canaanite, Philistine, and Judean residents and also situate the city within the greater



agricultural and economic context of the region. These stories will continue to be told as Sophia's work progresses.

In addition to the Khirbet el-Rai material, Sophia is applying her biochemical expertise to pottery residues from other archaeological sites. She is currently undertaking multiproxy analysis on the ceramic collection from Beer Sheva, Israel held in the Macquarie University History Museum and is also collaborating with CACHE Co-Deputy Director Dr Karin Sowada (History and Archaeology, MQ) and Dr Margaret Serpico (University College London) to examine residues from vessels imported into Egypt from northern Lebanon during the Old Kingdom / Early Bronze Age. These vessels were found in non-royal tombs at Giza and are now housed in the Museum of Fine Arts, Boston. Sophia is working with students to analyse samples using

gas chromatography-mass spectrometry and a scanning electron microscope, so far revealing the presence of pollen grains and phytoliths from a variety of vegetation, including poplar, wild grass, sage, and olive. These results help to supplement the Egyptian textual record in regard to what these imported vessels contained and how they were re-used once in the country, thus broadening our understanding of Egyptian–Levantine trade relations.

As an archaeological scientist, Sophia plays an important role in CACHE's mission of strengthening interdisciplinary collaboration. Her work presents new teaching and research opportunities that demonstrate how the scientific analysis of archaeological material can add new details to the wider reconstruction of the ancient past. From micro-botanical traces, big things grow!

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As an archaeological scientist, Sophia plays an important role in CACHE's mission of strengthening interdisciplinary collaboration. Her work presents new teaching and research opportunities that demonstrate how the scientific analysis of archaeological material can add new details to the wider reconstruction of the ancient past.
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Opposite, top: Dr Sophia Aharonovich collecting samples at Khirbet el-Rai, Israel. Credit: Sophie Gidley.

Opposite, bottom: Dr Sophia Aharonovich analysing soil samples in the on-site laboratory with student Edward Clancy. Credit: Sophie Gidley.

Above: Dr Sophia Aharonovich with student Ailish Schneider in the lab at Macquarie University, analysing residue samples from the Giza pottery collection of the Museum of Fine Arts, Boston. Credit: Karin Sowada.



Enabling Healthier Gomeroi/Kamilaroi Country

A team of researchers from Macquarie University and the University of Canberra are collaborating with senior Gomeroi/Kamilaroi Traditional Owners from the north-west Murray-Darling Basin in New South Wales to address concerns about the condition of the region's waterways through a respectful exchange of knowledge. The health of the waterways of Gomeroi/Kamilaroi Country have been impacted over the last century by agricultural activity and extreme weather brought about by climate change. The project, developed by Gomeroi/Kamilaroi Native Title applicants **Uncle Phil Duncan** (previously Walanga Muru, MQ and now Alluvium Consulting) and A/Prof. Bradley Moggridge (UCanberra) together with CACHE member **Dr Emily O'Gorman**, A/Prof. Fiona Miller, A/Prof. Sandie Suchet-Pearson, Dr Jessica McLean (all Geography and Planning, MQ), and Prof. Ross Thomson (UCanberra), seeks to facilitate cooperation between Indigenous and non-Indigenous stakeholders to mitigate the declining environmental health of the region.

Following a successful workshop on-Country in February 2019, pilot research in Moree and the Gwydir wetlands was planned for late 2020; however, this fieldwork has been postponed to 2021 due to the logistical impact of the COVID-19 pandemic. When able to go ahead, the on-Country visit will allow for collaborative discussions with Gomeroi/Kamilaroi Traditional Owners and water managers to capture data for future research publications and grant applications. The team are also under consideration for a NSW Environmental Education Grant to deliver two on-Country classrooms in 2021 and 2022 that will further enable two-way learning and intergenerational knowledge transfer of Indigenous understandings of water. A leading outcome of the project as a whole will be the preparation of ten points of best practice engagement with Indigenous communities in the Murray-Darling Basin for use by stakeholders.

Above: The research team with other participants of the 2019 on-Country workshop in 2019, Gwydir wetlands, Gomeroi/Kamilaroi Country, NSW, Australia. Credit: Sandie Suchet-Pearson.

Crises of Leadership in the Eastern Roman Empire (250–1000 CE)

The problems facing today's local and national leaders, such as civil unrest, environmental catastrophes, warfare, and – of course – pandemics, while uniquely shaped by present conditions, are paralleled across time. What can our current leaders learn from their predecessors in effectively managing times of crises? This is a leading question of the four-year ARC Discovery Project 'Crises of leadership in the Eastern Roman Empire (250–1000 CE)', which commenced in February 2020. The project, run by CACHE members **A/Prof. Eva Anagnostou-Laoutides** and **Prof. Bronwen Neil**, Dr Peter Edwell (all History and Archaeology, MQ), and Prof. Theodore de Bruyn (UOttawa), aims to evaluate how Late Antique Roman leaders dealt with periods of uncertainty and what lessons can be derived from their approaches. The team is assisted by Dr Phoebe Garrett who works on emperor lists and their reception in late antiquity.

A key body of evidence for this project is the 1st millennium 'end of days' discourse. The various political, social, and environmental upheavals of the mid-3rd to 10th centuries CE prompted apocalyptic consideration (as is sometimes the case today), with writers speculating on how the world would end, who would be saved from destruction, and who would be condemned. Such sources often contain social

critique indicating support or dissent of the civic and religious authorities of the day, and it is largely through this perspective that the project team are assessing the nature of effective – and ineffective – leadership during this period. The interdisciplinary team will draw upon the experiences of communities across the Eastern Roman Empire and beyond, and pursue multiple research questions, including how leaders could exploit periods of instability, what role their advisors played, and how approaches to internal and external problems compare. The models of leadership constructed through this timely investigation can help to inform the similar crises faced by community leaders today.

CACHE ECR Affiliate **Dr Matthew O'Farrell** is undertaking a two-year postdoctoral fellowship as part of the project. He is examining the reaction of Zoroastrian leaders to the Arab conquests of the 7th century CE and the fall of the Persian Empire, with particular focus on the use of memory and ideology in the historical and apocalyptic texts of the period.

Two workshops on the themes of the investigation are planned for May and November 2021, with local and international participants, and a project website is in development.

Below: 'End of days' speculation has been a recurring concern throughout history. Ludwig Meidner, Apocalyptic City, 1913. © Ludwig Meidner-Archiv, Jüdisches Museum der Stadt Frankfurt am Main.



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Opposite: Near Windorah, Queensland, Australia. Credit: Greg Spearritt.
Back cover: White Desert, Egypt. Credit: Alice McClymont.

