



The Bulletin 424

The Royal Society of New South Wales

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30 August 2018

For Your Diary:

6 September 2018
RSNSW & SMSA

Great Australians You Have Never Heard Of
Lecture 3

Em Prof Brynn Hibbert AM FRSN

6 for 6.30-7.30 pm

Mitchell Theatre, SMSA, 280 Pitt St

See p. 5 for more information

20 September 2018

Southern Highlands Branch Lecture

Professor Bert Roberts

**'When Did Australia's Human History
Begin?'**

6.30pm start

Mittagong RSL



Patron of The Royal Society of NSW

His Excellency General The Honourable
David Hurley AC DSC (Ret'd)
Governor of New South Wales

Open Lecture & OGM

**'The Psychology of Eyewitness
Memory'**

Wednesday, 5th September 2018

Professor Richard Kemp

**School of Psychology
University of NSW**



See page 3 for more information

Date: Wednesday 5th September 2018

Time: 6:00 pm for 6:30 pm

Venue: Gallery Room, State Library of NSW
(Entrance: Shakespeare Place, Sydney)

Dress: Business

Entry (including a welcome drink): \$15 for Members and Associate Members
of the Society, \$25 for Non-Members.

Dinner (including drinks): \$85 for Members and Associate Members,
\$95 for Non-Members.

Reservations must be made at least 2 days in advance

Reservations: <https://nsw-royalsoc.currinda.com/register/event/51>

Enquiries: royalsoc@royalsoc.org.au Phone: 9431 8691

All are welcome.

From the President – Meteorites and Music



In the Bohemian part of the Czech Republic there is a little town called Cesky Krumlov. It lies in a loop of the Vlatava River, and is overlooked by a splendid castle, painted in the Renaissance manner. With its water mill, cobbled streets and castle, Cesky Krumlov is unreasonably cute. By pure chance I stayed in an apartment within a tiny museum in the town, the Moldavite Museum. That is how I came to meet moldavites.

As I learned there, moldavites are glassy rocks discovered in Bohemia around the time the First Fleet left London, and much valued by collectors. They are understood now as being formed from a giant meteorite striking the earth in western Bavaria some 14 million years ago, with the impact resulting in melted fragments spread over a wide area. At their best they are a translucent green and amazingly wrinkled. They are named after the Moldau River, which (as I was delighted to learn) is the German or English name for the Vlatava.

‘The Moldau’, as many readers will know, is also the (English) name of a beautiful piece of music by the Czech composer Smetana, which very successfully evokes the sense of gentle movement on the river that (as I didn’t know until that day) under the name Vlatava flows through both Cesky Krumlov and Prague. It is a favourite of mine.

Why do I mention these two items? Because to me they symbolise perfectly the Royal Society of New South Wales. In this Society we are allowed (even required?) to be interested in many different aspects of ‘Science, Literature, Philosophy and Art’. We are expected to be open to learning about new things. It is the breadth of the Society’s remit that is so appealing to many of us.

I am pleased to report that Professor Heinrich Hora FRSN, long a stalwart of the Society and an expert on High Powered Lasers, has been invited to join the International Committee on Ultrahigh Intensity Lasers. I also want to express my personal pleasure at the election of Professor Nalini Joshi AO FAA FRSN as Vice President of the International Mathematical Union. Election to this high office in the premier international body for mathematics is a fitting recognition of the contribution being made by Nalini and other Australians to worldwide mathematics.

Ian H. Sloan AO FAA FRSN
President, Royal Society of New South Wales
President@royalsoc.org.au

Professor Richard Kemp

School of Psychology, University of NSW

'The Psychology of Eyewitness Memory'



In criminal investigations eyewitnesses often provide police with vital information leading to the identification of a suspect. However, a detailed examination of cases of wrongful conviction from the USA shows that, while providing compelling evidence, eyewitnesses can be mistaken. In this presentation I will describe how psychological research into eyewitness memory can be used to inform policy change to reduce the risk of erroneous conviction. Using an interactive format, I will demonstrate the surprising fragility of human memory and describe research I have undertaken with colleagues to identify procedures that increase the risk of memory distortions, and measures which can be employed to safeguard against these risks. I will end by describing some challenges and opportunities for the future, including the increased use of machine face-recognition systems to monitor public spaces, and a new smartphone app developed in conjunction with police and designed to help witnesses provide detailed, accurate accounts of events.

Professor Richard Kemp is a cognitive scientist and forensic psychologist who seeks to apply research in the fields of human memory and perception to aspects of the legal system. Richard obtained his PhD from London University and moved to UNSW in 2001. His current research interests include identity verification and face perception, eyewitness memory, police interviewing and forensic science evidence. Richard has undertaken his research in collaboration with a variety of partner organisations, including State and Federal government agencies, police and emergency services, banks and financial service providers. He has provided expert evidence in a number of significant court cases in Australia and overseas, and is regularly asked to address conferences of judges, lawyers, police and other legal professionals. Current projects include work with the Australian Passport Office to detect identity fraud in passport applications, the impact of police body-worn cameras on officers' recall of events, and the validation of forensic science techniques. Professor Kemp has about 100 peer reviewed publications, which have been cited more than 4,500 times. He has been awarded over \$3 million in competitive research funding from ARC and other bodies.

2018 Events

Royal Society – Southern Highlands Branch

Date*	Event	Speaker	Topic	Location**
20-Sep-18	Public Lecture	Prof Bert Roberts	When Did Australia’s Human History Begin?	Mittagong RSL
18-Oct-18	Public Lecture	Hugh Mackay	The State of the Nation Starts in Your Street	Mittagong RSL
15-Nov-18	Public Lecture	Dana Cordell	Sydney Food Futures	Mittagong RSL

*Lectures are the third Thursday of each month.

**1st Floor, Room Joadja/Nattai.

Professor Richard ‘Bert’ Roberts
Director, Centre for Archaeological Science
University of Wollongong

‘When Did Australia’s Human History Begin?’



The remarkable new evidence from Madjedbebe in northern Australia contributes to our ever-expanding scientific notebook about Australia’s earliest modern humans. The research raises fascinating points about how long ago the first humans arrived in Australia, how long these people existed with megafauna, and the overlap between modern humans and Neanderthals.

Arrival of the first humans in Australia has been robustly debated for decades. Until now, it was speculated that Australia wasn’t occupied until 47,000 years ago. Madjedbebe is the oldest known place of human occupation in Australia. It sets a new line in the sand for human arrival into Australia at least 65,000 years ago. Indigenous Australians have been coming to this rock shelter for over 2,600 generations.

Professor Richard ‘Bert’ Roberts is the Director of the Centre for Archaeological Science, established at the University of Wollongong in 2010 to develop, integrate and apply modern scientific techniques to answer fundamental questions about human evolution and the analysis of material remains of past human life and activities. In addition, he is the Director of the ARC Centre of Australian Biodiversity and Heritage.

Anne Wood FRSN₄

Great Australians You Have Never Heard Of

Lecture 3

Emeritus Professor Brynn Hibbert AM FRSN



*Image: Toryboy,
Winner of the
Melbourne Cup 1865,
Samuel Salkeld Knights
1818-1880 artist.
(Cowen Gallery, State
Library of Victoria)*

Join Brynn Hibbert AM FRSN to discover the identity of three Great Australians for the price of one. Meet two scientists and a sports person; or two men and a woman; or two of British descent and an Indigenous person; or two law abiding people and an embezzler; or a stalwart of the RSNSW and two who probably never heard of the Society.

These Great Australians did not know each other but are connected by one of the oldest activities in the colony: horse racing. The first horse race was in 1810, and Royal Randwick, where some of our story evolves, became the home of the Australian Jockey Club in 1860.

Emeritus Professor Brynn Hibbert AM FRSN occupied the Chair of Analytical Chemistry at the University of New South Wales since arriving from England in 1987 until his retirement in 2013. His research interests are in metrology and statistics in chemistry, ionic liquids and electroanalytical chemistry, but he also does a sideline in expert opinion, scientific fraud and presenting science to the public. More recently he has become a go-to expert witness in matters of drugs (of abuse, and sports). He is the recent Past President of the Royal Society of New South Wales, and was made a member of the Order of Australia in 2018. He has published around 260 papers, 5 books and 3 patents.

Date: Thursday 6 September 2018, 6pm for 6.30 to 7.30pm. Light refreshments will be served.

Cost: \$15 members of RSNSW and SMSA, \$20 non-members and guests

Location: Mitchell Theatre, Level 1, Sydney Mechanics School of Arts, 280 Pitt St, Sydney (near Town Hall Station)

Registration: <https://smsa.org.au/events/event/great-australians-youve-never-heard-of-3/>

**Report of the 1265th OGM
Wednesday 8th August 2018**

Associate Professor Muireann Irish FRSN
The Brain & Mind Centre, University of Sydney

**‘The Final Frontier - On the Complexity and
Frailty of Human Memory’**



Associate Professor Muireann Irish presenting on 8th August

Professor Muireann Irish’s research focuses on the cognitive neuroscience of the memory. Ultimately, she hopes that her research will further the early detection of dementia and the development of subsequent interventions. In order to study the complexity of the brain, different concepts of memory are used, in particular with regards to dementia and Alzheimer’s Disease. The four types of memory, i.e., episodic, semantic, spatial and procedural, interact. She explained that in our episodic memory we recollect special events and experiences as well as shopping lists and phone calls. Essentially it is the ability to encode, store and retrieve information that is crucial for our everyday functioning. Clinically, Alzheimer’s Disease shows a decline in episodic memory as well as disorientation in time and place, and thus the progressive disruption of a core memory network.

Semantic memory, on the other hand, refers to our ability to harness conceptual knowledge of the world, e.g., $2 \times 2 = 4$, or that a banana is yellow. As our semantic knowledge is embedded in our past memories, Semantic Dementia clinically shows a loss of not only conceptual knowledge, but also preserved syntax. However, there is a relative sparing of episodic memory, so one can remember events and autobiographical details. Using neuroimaging, disruptions of the core memory network are displayed in a progressive atrophy of the neural network in the medial and frontal temporal lobe.

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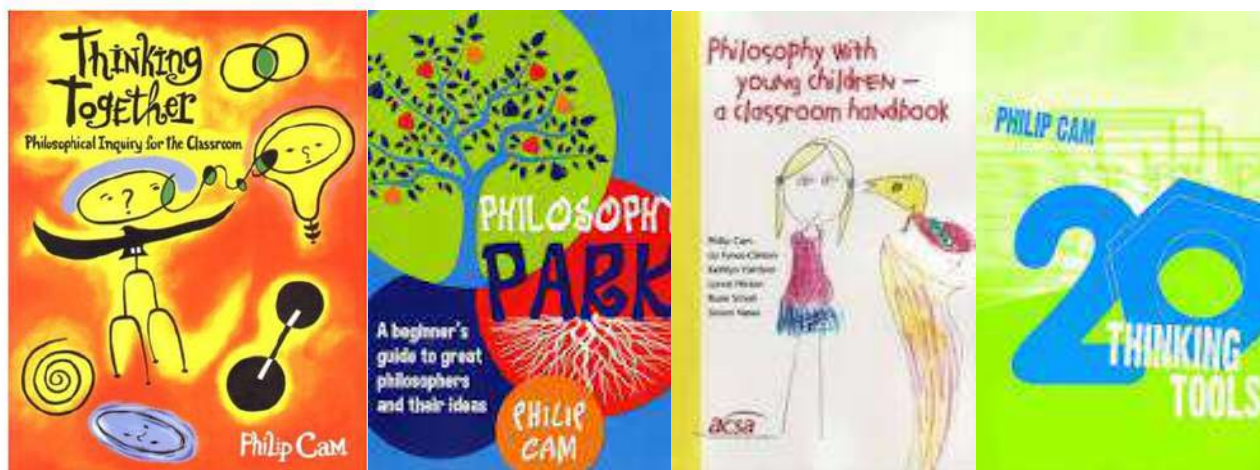
Report of the 16th August 2018 Meeting Royal Society Southern Highlands Branch

Associate Professor Philip Cam

President, Philosophy in Schools Association, NSW

‘Philosophy for a “Thinking Curriculum”’

Dr Philip Cam is Associate Professor in the School of Humanities and Languages at UNSW and is also President of the Philosophy in Schools Association of NSW. He has a DPhil in Philosophy from the University of Oxford, and is an international authority on philosophy in schools. Philip helped to pioneer the introduction of philosophy into schools in Australia and has run workshops for educators around the world. He has published extensively in the field and his work has been widely translated. On the evening of the lecture at Mittagong, 73 people arrived in the comfortable Joadja/Nattai conference room at the RSL to greet the speaker.



Some of Philip's publications

Philip opened the lecture with the statement that if we are serious about teaching children to think, then we need to be serious about structuring the curriculum around thinking. This can only be achieved if we pay attention to the general thinking strategies and broad conceptual understandings that find a natural home in philosophy. Then by looking at the concepts and procedures of philosophy, we can help to integrate the curriculum and at the same time, make children more effective participants in the process of learning. His firm belief is that philosophy for children not only helps them to develop habits of good thinking, it provides them with a means of making broader connections out of which richer and deeper understandings can grow.

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There is no doubt that modern children are growing up in a world increasingly flooded with information. In this new world, they have to deal with diverse opinions and uncertain claims, and to decide for themselves what is important and what is not. It is a world in which change is often rapid and unpredictable with the consequence that there is constant need to adapt. Society itself has become more complex and culturally diverse in recent years, and our country is finding its way in a region that is undergoing considerable transformation. In such conditions, it is clear that there is a serious need for our children to be given the opportunity to develop into adaptive, open-minded citizens. Philip emphasized that general intellectual skills, attitudes and values that encourage critical and creative thinking are needed as never before.



The School of Athens (1509-1511) by Raphael, depicting famous classical Greek philosophers

Philosophy is a highly meta-cognitive discipline with a particular kind of focus on thinking. It involves not only careful thinking, but also thinking about thinking. Since philosophical thinking always concerns the thinking process, philosophy has developed general purpose tools for conceptual exploration and reasoning. By adapting these tools to the classroom, and teaching our students to use them, we can help children to acquire the kinds of mental habits that enrich conceptual development and promote better reasoning. These habits make children effective participants in their own intellectual development. It is only by being involved in this way that children can confidently learn to think for themselves.

Throughout the lecture, Philip Cam presented appealing images of children participating in the learning processes he was describing. Often the students were seated in a circle when a topic was being talked through. The clever device of holding the 'speaker's ball' ensured that just one student at a time was free to speak uninterrupted on an issue. Before another child could respond or speak on the issue under discussion, they too had to be passed the 'speaker's ball'.

This thought-provoking lecture met with huge acclaim. Associate Professor Philip Cam was still fielding questions from the audience long after the formal lecture had concluded.

Anne Wood FRSN

Royal Society of NSW Fellows in the News

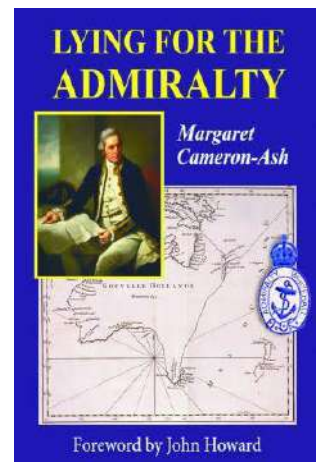
Maths First for Professor Nalini Joshi AO FAA FRSN

Congratulations to Professor Nalini Joshi on being elected first Australian Vice-President of the International Mathematical Union, the worldwide body representing mathematics. As well as being an outstanding mathematician, Professor Joshi, of the University of Sydney, is a pioneer in her field, the first female professor of mathematics and the first female head of the school of mathematics at her university. Joshi helped establish the Science in Australia Gender Equity (SAGE) program in 2017 and was its first co-chair: ‘In addition to longstanding interests in mathematics research and education, I have a particular interest in increasing the participation of women and minority groups in science and mathematics.’



Margaret Cameron-Ash Hon FRSN – New Book on Cook

Members of the Royal Society gathered at the State Library of New South Wales to hear Emeritus Curator Paul Brunton AM launch this curious book about Captain Cook. He argued that the author, Margaret Cameron-Ash, a long friend of the RSNSW, had made an excellent circumstantial case – in the absence of smoking guns – that Captain Cook was under orders *not* to reveal his best discoveries of the New South Land. Why didn't he mention Port Jackson? – yet future voyagers apparently knew all its features! What happened to Bass Strait? It is inconceivable that the Greatest Navigator of the Age would miss these. No – it is best understood in the light of the furious rivalry between the French and British in the South Seas. The blurb calls the book a ‘cartographical thriller’, and indeed it is!



Stephen Hill AM FTSE FRSN Questions Economic Paradigm

Brynn Hibbert represented the Society at the launch of a book which surveys modern life from a new point of view: *The Kyoto Manifesto for Global Economics: The Platform of Community, Humanity and Spirituality*, edited by Stephen Hill with Japanese collaborators Stomu Yamsh'ta and Tadashi Yagi. Stephen Hill is the epitome of the Enlightenment scholar: a Professor at 30 and United Nations Man-about-the-Pacific. ‘The book will present the dimensions of a new paradigm for economic-oriented action which seeks to reverse this progressive capture of our humanity into subservience to the demands of an enormously powerful global economics regime.’

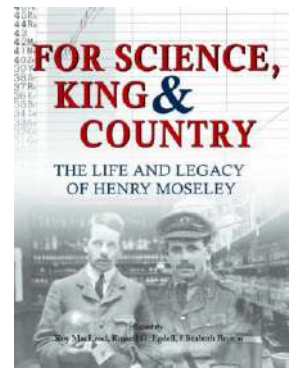


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New Book Edited by Professor Roy MacLeod FRSN

For Science, King & Country, edited by Roy MacLeod FRSN, Russell G. Egdell and Elizabeth Bruton, is a commemoration of Henry Moseley's life, work, and legacy. Killed on the Somme at the age of 27, Moseley was widely regarded as the most promising British physicist of his generation. The book charts his brief career, military service and lasting influence in a field of science that is still rapidly developing.



Associate Professor Muireann Irish FRSN on 'The Final Frontier' (contin. from p. 6)

Professor Irish presented some examples of how patients are influenced by the loss of semantic and episodic memories. Combining novel experimental tools and advanced neuroimaging her research displays how the loss of distinctive brain networks not only impacts the remembering of the past, but also how we envisage the future. The retrieval of autobiographical memory is essential for a sense of continuity, but all memories are not created equal as they contain an emotional component. As time goes by some memories may fade and older memories may become semanticised. In longitudinal neuroimaging studies, it could be shown that autobiographical memories are associated with semantic processes and supported by a complex neural network. As these autobiographical memories contain a distinct self-referential aspect they are important for the future of the memory. Using the past we predict, simulate and learn to adapt and consequently construct the future. Therefore to envisage the future is a major aspect of memory.

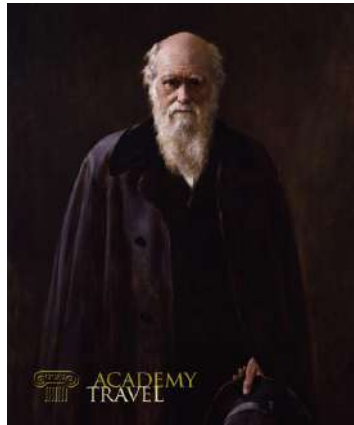
Researchers at the Brain & Mind Centre studied the role of semantic memory in cases of Semantic Dementia and Alzheimer's Disease, with control groups, by letting the subjects imagine novel, atemporal scenes and by taking neuroimages. They found that there is a contrasting role of the left versus the right hippocampus in scene constructions. Consequently, depending on the progression of the dementia, there are clinical implications, including medication adherence and safety around the house; decision making, e.g., financial planning and advanced care directives; and also motivation and mood, with resulting apathy, depression and lack of social engagement.

When asked about predicting Alzheimer's Disease, Professor Irish said that her lab is working towards bringing all research findings together to develop a test for Alzheimer's Disease in the early stages. There seems to be a gender effect in Alzheimer's Disease, but further study is required to investigate cultural factors. The relation of dementia to other aspects of life were raised, e.g., the impact of exercise on cardio-vascular health and lowering cholesterol. The speaker agreed that a whole-body approach is required, but one must also look at other scenarios, e.g., the influence of music in overcoming some of the deficits of memory.

The History of Science: Padua – Florence – Paris – London

A tour for the Royal Society of NSW in conjunction with the State Library of NSW Foundation

19 September – 4 October 2019



Overview

Explore the history of science from Vesalius in Padua, to Galileo in Florence and the flourishing of modern science in Paris and London. This 16-day private tour for the Royal Society of NSW in conjunction with The State Library of NSW Foundation includes guided visits to many exceptional museums, rare access to collections, libraries and archival material, and the expert guidance of specialists and curators. It follows the great story of modern science, taking you from Padua, to Florence, Paris and London and includes day trips to Bologna, Siena and Cambridge. A four-night pre-tour extension to Venice is also available.

Discover

- The birth of modern science, from Galileo's telescopes to Darwin's theory of evolution
- The history of medicine: Vesalius in Padua, Pasteur in Paris and the medical collections of London
- The transmission of knowledge, from rare books and manuscripts to the modern museum
- The history of the university at Padua, Bologna, Paris and Cambridge
- Interaction between the arts and sciences in moments of great change from the Renaissance to the modern world.

Tour Details

Dates: 19 September – 4 October 2019

Price: \$9,270 pp. twin share; \$2,280 single supplement

For more information and to register your interest contact: Academy Travel, 9235 0023
info@academytravel.com.au.

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The History of Science (contin.)

Tour Highlights

- Padua: the world's first anatomy theatre, the oldest botanic garden and Giotto's Scrovegni Chapel
- Special access to library collections in Florence, Paris and London
- Private tour of the Pompidou Centre, Paris' modern art museum
- Day trips to Siena, Bologna, Cambridge and Greenwich
- Specialist museums dedicated to Pasteur, Curie, Galileo & Darwin
- London science: from the manuscripts of the Wellcome Library to the National Science Museum.

Itinerary



Days 1–3: Arrive Padua; visit the world's oldest anatomy theatre and oldest botanic garden, visit Scrovegni Chapel, Giotto's masterpiece; day trip to Bologna.

Days 4–6: Explore Florence, including the Galileo Museum, Uffizi, and special access to rare collections; day trip to Siena and the wonderful cuisine of Chianti.

Days 7–10: Discover a different side of Paris, from special museums dedicated to Pasteur and Curie to a private tour of the Pompidou Centre.

Days 11–15: Arrive London. Enjoy visits to Down House, the home of Charles Darwin, the National Observatory and prime meridian at Greenwich, and a range of museums from the Museum of Natural History, to the private collection of the Royal College of Physicians; day trip to Cambridge.

Day 16: Departure.

Tour Leader

Emeritus Prof Robert Clancy AM FRSN has a distinguished career in medical research and has published books on the early mapping of Australia. He has led many similar successful expeditions. Expert guides will meet the group in each destination.

Maximum Group Size: 20



Schedule of RSNSW Events 2018

Date	Event	Speakers	Topics and Presentations	Location
5-Sep-18	Ordinary General Meeting	Prof Richard Kemp	The Psychology of Eyewitness Memory	State Library of NSW
6-Sep-18	Great Australians Lecture 3	Em Prof Brynn Hibbert	Great Australians You Have Never Heard Of	SMSA
3-Oct-18	Ordinary General Meeting	Prof Gordon Wallace	3D Printing of Body Parts	State Library of NSW
7-Nov-18	Ordinary General Meeting	A/Prof Tara Murphy	Gravitational Waves	State Library of NSW
12-Nov-18	Great Australians Lecture 4	Prof Alison Bashford	Great Australians You Have Never Heard Of	SMSA
29-Nov-18	RSNSW & Four Learned Academies Forum	TBA	Towards a Prosperous yet Sustainable Australia. What Now for the Lucky Country?	NSW Government House
5-Dec-18	Ordinary General Meeting	Jak Kelly Award Winner	2018 Jak Kelly Award Presentation & Christmas Party	State Library of NSW

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