



The Bulletin 413

The Royal Society of New South Wales

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23 August 2017

For Your Diary:

Poggendorff Lecture 2016

A/Professor Andrew Robson
"Applied Remote Sensing Applications
For Australian Agricultural And
Horticultural Industries"

Tuesday, 29 August 2017, 6:30 pm,
Sydney Mechanics School of Arts
280 Pitt Street, Sydney, see page 8

Joint Event

Susannah Fullerton

"Samuel Pepys, His Library and the
Enlightenment "

Monday, 4 September 2017
Mitchell Theatre, Sydney Mechanics School of
Arts, 280 Pitt St, Sydney, 6:00 for 6:30
See page 3 for details

Southern Highlands Branch

Public Lecture

Prof Peter Schofield
Alzheimer's Disease

Thursday, 28 September 2017, 6:30 pm
Performing Arts Centre
Chevalier College, Bowral



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

Wednesday, 6 September 2017

Dr. Helen Mitchell
**"Multisensory music:
listening by ear and eye?"**



For more details about Dr. Mitchell and her talk, see p. 6

Date: Wednesday, 6 September 2017; 6:00 pm for 6:30 pm

Venue: Union, University and Schools Club, 25 Bent Street, Sydney

Entry: \$10 for Members and Associate Members of the Society,
\$20 for Non-Members, which includes a welcome drink.

Dress: Business

Dinner (including drinks): \$80 for Members and Associate Members,
\$90 for Non-Members.

Reservations must be made at least 2 days in advance

Reservations: <https://nsw-royalsoc.currinda.com/register/event/36>

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

All are welcome.

Continued on page 6

From the President

We have had a busy month starting with Professor Ann Williamson FRSN talking to a large audience – we have outgrown the Library in the Union, University and Schools Club – on the future of self-driving cars. Professor Williamson pointed out problems of the new technology, both from the aspects of safety regulation, and their interaction with human-driven vehicles in the inevitable change over period. Instead of the usual pieces we read in the press, this exposition was backed up with data and serious academic knowledge.

The OGM was also our opportunity to present certificates to a most interesting body of new Fellows: Muireann Irish (cognitive scientist), Kevin Dunn (geographer), Joanna Mendelssohn (art critic and researcher), Angela Moles (plant ecologist), Brian Preston (Chief Judge of the Land and Environment Court), Virginia Judge (ex-State minister and public figure), Alan Jeary (structural engineer) and Mark Taylor (environmental management). I suspect we have a seriously critical mass to contribute to the intellectual life of NSW.

The Sydney Science Festival (aka Science Week) went well, with the RSNSW contributing a lunch-time series in the City at the University of Sydney Business School in Castlereagh Street. (I recall the couplet by P B Shelley: “I met Murder on the way - He had a mask like Castlereagh.”). Professor Jim Kehoe FRSN and I also contributed to a seminar on education held at the Parramatta campus of the University of New England

Having heard all the talks, I can say how particularly good they were. These lectures attract interested members of the public who come out in their lunch hours, colleagues, and society members. We take the opportunity to take contact details for potentially new members and raise our profile. *Continued page 9.*



New Fellows



Muireann Irish



Kevin Dunn



Joanna Mendelssohn



Angela Moles



Virginia Judge



Alan Jeary



Mark Taylor



Brian Preston

Public Lecture
“Samuel Pepys, His Library and the Enlightenment”
Susannah Fullerton

Author, Lecturer and Literary Tour Leader, susannahfullerton.com.au

Date and time: 4 September 2017, 6.00 pm for 6.30-7.30 pm

Venue: Mitchell Theatre, Level 1, 280 Pitt St, Sydney
Sydney Mechanics School of Arts,

Cost: \$15 Fellows/Members, \$20 Friends (per Lecture)

Register for Lecture here:

<https://nsw-royalsoc.currinda.com/register/event/42>



Susannah Fullerton, OAM, FRSN will discuss the life and diaries of Samuel Pepys and what they tell us about the Enlightenment. She is Sydney’s best known lecturer on famous authors and their works. She is also Patron of the Rudyard Kipling Society of Australia. Susannah leads popular literary tours for Australians Studying Abroad to the UK, France, Italy and the USA. She is the author of several books about Jane Austen and also of *Brief Encounters: Literary Travellers in Australia*, and has written and recorded two audio CDs. She has been President of the Jane Austen Society of Australia for the past 21 years.

This lecture will be the first in a series of five events co-hosted by the Royal Society of New South Wales and the Sydney Mechanics’ School of Arts. Four lectures will describe the beginnings of the Enlightenment, its impact on Colonial Australia, and the development of two key portals of the Enlightenment – specifically, the library and museum – over 200 years. The series will conclude with an interactive sophistry taking the themes of the series, and discussing them in the context of contemporary Australian life. The lectures will be presented by an outstanding group of experts in the field, with the topics chosen to represent a broad overview of the Enlightenment and its continuing worldwide impact.

Monday, 6 November 2017: “What the Enlightenment Meant to Australia.” John Gascoigne

Thursday, 1 February 2018: “Learning, Adaptation and the Enlightenment: The Museum.” Kim McKay

Thursday, 1 March 2018: “Learning, Adaptation and the Enlightenment: The Library.” Paul Brunton

Thursday, 5 April 2018: “Sophistry: “Global Deflation: The Enlightenment has Failed!” George Paxinos

Report of Open Lecture

Wednesday, 2 August 2017

Professor Ann Williamson FRSN “Self Driving Cars: Will They Help?”



Prof. Ann Williamson, Director of the Transport and Road Safety (TARS) research centre and Professor of Aviation Safety at UNSW Sydney, addressed the sometimes contending perspectives of engineering and technology versus the human factor and ergonomics of self-driving cars.

Self-driving cars seem to be just over the horizon as many cars have already driver-assisting technology. In addition, many authoritative organisations estimate that the automation (full self-driving) will give a cost of saving of 2-4k\$ (US) per car plus a 95% reduction in road-traffic crashes.

At present, three levels of automation can be observed: 0 – no automation, 2 – some functions, e.g. stability control, 3 – combined function automation, e.g. adaptive cruise control.

The next two levels of automaton are (1) limited self-driving automation that still requires monitoring and intervention by a driver, and (2) full self-driving by 2025.

There have been a range of automated and driver-assisting technologies, but they do not take into account the complexities of human interaction with automation (papers by Brainbridge ‘The Ironies of Automation’ 1983, Parasuraman & Riley ‘Humans and Automation: Use, Misuse, Disuse, Abuse’ 1997). Some lessons may be learnt from aviation’s transition to automation, commercial aviation being the safest form of transport.

There are a few evaluation studies of drivers in a number of technology-assisting circumstances. They have revealed that (1) with cruise control drivers have a slower reaction time, (2) reliable in-vehicle warning improves the response time, but frequent false alarms reduce it. There is evidence that overall driving performance deteriorates with increasing automation.

Automation itself can interact with the design of the vehicle. Human drivers experience poor vehicle design but learn to live with it. Nevertheless, driver errors often arise from the vehicle design. It is unknown how well the automation mechanisms will adapt to vehicle design.

For the higher levels of automation, usability issues include: (1) an increasingly passive role for drivers in monitoring that may increase errors, (2) matching automation to driver’s need for assistance, (3) time delays of approximately 8 seconds in transferring control from automation to the human driver. *Go to page 7*

Southern Highlands Branch Lecture, 17 August 2017

Hugh Mackay AO

“The Changing Place of Religion in Australia”

Around two-thirds of us say we believe in God or some “higher power”, but less than one in ten Australians attend church weekly. Hugh Mackay presented this discrepancy as one of the great unexamined topics of our time. His view is that while our attachment to a traditional idea of God may be waning, our desire for a life of meaning remains as strong as ever. Mackay says that, increasingly, people identify themselves as SBNRs, “Spiritual but not religious.”

Globally, religion is on the rise. In distinct contrast to the waning attendances at church in Australia, Canada and New Zealand, the proportion of people attached to the world’s four biggest religions – Christianity, Islam, Buddhism and Hinduism – rose from 67 % in 1900 to 73% in 2003 and may reach 80% by 2050. These figures are taken from Micklethwaite and Wooldridge’s *God is Back* (2009). Fenggang Yang, director of Purdue University’s Centre on Religious and Chinese studies, states that by 2030, there will be more Christians in China than in any other country on earth. By then, Chinese churchgoers will outnumber US churchgoers.

In Western countries, regular churchgoers tend to be older than the average age of the population, predominantly female and mostly from families where there has been a tradition of church attendance. Religious observance also appears to be associated with less affluence; church attendance in Ireland, for example, fell sharply when Ireland was briefly a “tiger economy” but has revived recently as the economy flags, despite the sexual-abuse scandals rocking the Catholic Church.

Hugh Mackay has found in his research, involving countless interviews, that many people are now seeking ways of making sense of religious ideas,



including the idea of Christian faith, without relying on the traditional notions of a supreme being, and without surrendering themselves to a conventional framework of doctrines and beliefs. He asks why so many people are now sending their children to church schools when they themselves may rarely darken the door of a church. In this context, he made the comparison with Voltaire who stated that “*I want my attorney, my tailor, my valets and even my wife to believe in God, and I fancy then that I’ll be robbed and cuckolded less*”. It seems that both the parents and Voltaire admired the spiritual values which are associated with religion, even though they did not themselves necessarily submit to the same religious beliefs and doctrines.

In further developing his subject of SBNR, Hugh Mackay raised the issue of how faith itself, with no connection whatsoever with traditional doctrines and beliefs, can profoundly influence a person’s life. The case study he chose was published in the *New England Journal of Medicine* in 2002, the study involving 180 patients suffering from the pain of osteoarthritis of the knee. At that time, more than 650,000 procedures of arthroscopic lavage and debridement were being conducted annually at a cost of roughly \$5000 each.

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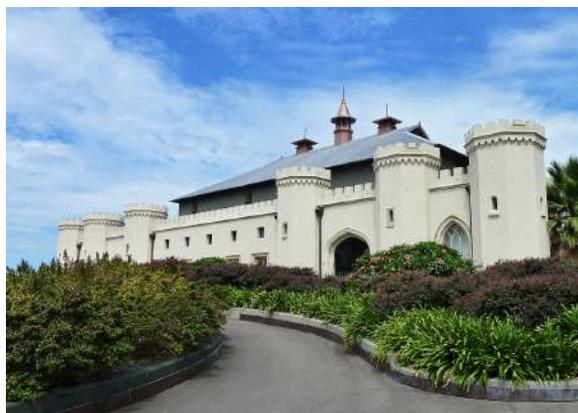
Multisensory music: listening by ear and eye?

Listening is regarded as the most fundamental way to engage with a musical performance, but this assertion is challenged by a growing body of research which suggests that sight trumps sound. Music is now widely recognised as a multisensory experience, and the challenge for music education is to absorb and include these recent research findings in the music curriculum. This presentation will decipher the complex perceptual skills required for listening to music performers. It will consider how new experiential learning strategies in music education can prepare future music professionals as critical thinkers about music performance.

Dr. Mitchell has a multidisciplinary background in music, as a singer, music scholar and music performance researcher. Listeners' perception of sound quality is central to Helen's music performance research. Her current investigations concern how listeners recognise and describe individual performers' sound identities, and how listeners 'hear' music performers to discern to what extent audiences integrate audio and visual information to identify individual performers.

Dr. Mitchell graduated in music from the University of Oxford in 2000 and moved to Australia to undertake doctoral studies at the Sydney Conservatorium of Music in 2001. From 2004-5, she was Dean of Students at The Women's College within the University of Sydney. From 2005, Helen was Australian Postdoctoral Fellow in an ARC funded study and conducted a longitudinal study of music training, tracking singers through the duration of a tertiary degree and mapping perceptual and acoustic changes in their vocal quality to their acquisition of technical mastery.

Now a senior lecturer at the Conservatorium, Dr. Mitchell convenes Postgraduate and Honours Research Methods courses and takes graduate seminars in empirical music studies and research ethics. She is Performance Honours Coordinator and also supervises Honours, Masters, DMA and PhD students in their research projects in music performance.



Latest issue of the Society's Journal Announced

Emeritus Professor. Robert Marks, Editor of the *Journal and Proceedings of the Royal Society of New South Wales*, has announced June 2017 issue. It includes a paper by Clarke Award-winner Prof. William L. Griffin and his co-workers on deep-earth methane and mantle dynamics. Among other things, there are papers ranging widely across the topics of

chemical synthesis of biological products, the economist William Stanley Jevons, the evolution of flowering plants, the psychology of breast cancer, the cognitive-neuroscience of attention, the paleontology of the Northern Territory. Access the papers at:

<https://royalsoc.org.au/society-publications/current-issue>

... Continued from Page 5

Hugh Mackay AO “...Religion in Australia”

In this particular study, after the 180 patients had undergone randomization, 61 were assigned to the lavage group, 59 to the debridement group and 60 to the placebo group. The placebo group emerged from their operations with similar surface wounds to those of the other groups. Astoundingly, there was no discernible or statistically significant difference in pain relief in the treated patients compared with the placebo group!

In this intriguing lecture, Mackay presented a taste of his research and insights into our seemingly impenetrable life questions. The fascinated audience of 60 people listened intently as to how our existential angst, our dreams, ideals and our beliefs are so intricately

intertwined. We personally may often be tempted to place considerations such as these in the “too hard” basket, but it is clear that Hugh Mackay has no such reservations. In this lecture, and in his latest non-fiction book, *Beyond Belief*, Hugh Mackay has endeavored to present a glimpse into the complex network of reactions of people to questions at the heart of our existence, and to our claims of belief in religion or simply being SBNR.

Anne Wood FRSN

... Continued from Page 4

Prof. Ann Williamson “Self Driving Cars”

(4) Unreliable warning and other systems, and (5) a track record of ‘selling’ unsophisticated systems in vehicle. There are issues of trust and acceptance, i.e. users’ awareness of poor design as well as legal and ethical matters.

In order to optimise automation and its safe usage, the drivers must understand their role. Ensuring good understanding requires that governments set sound safety standards that influence the composition of the vehicle fleet and that manufacturers pay more attention to producing vehicles with good human-machine interfaces, not just introducing the newest technologies.

In an extensive question time, we discussed the possibility that the accident rate might be

an increase when there is a mix of cars with limited self-driving automation before a move to full self-driving. Moreover, full automation is not universally desired. Surveys show that a number of people like to drive a car and might not move to self-driving.



Prof Willams receives the vote of thanks from A/Prof. Graham Bell FRSN, who happens to be her husband.

Poggendorff Lecture 2016

“Applied Remote Sensing Applications For Australian Agricultural And Horticultural Industries” Associate Professor Andrew Robson, University of New England
Tuesday, 29 August 2017, 6:30 pm, Sydney Mechanics School of Arts, 280 Pitt Street, Sydney

Associate Professor Robson is a leader in agriculture remote sensing research and development. This research is set to provide a network of precision sensors that collect “big data” in real time concerning threats to food crops across Australia, thus equipping farmers with the best possible information for decisions about their produce. Andrew Robson receiving his award from His Excellency General The Honourable David Hurley AC DSC (Ret'd), Governor of New South Wales In the ‘Poggendorff Award’ lecture, Associate Professor Andrew Robson, will present a brief theory of remote sensing with relevance to agriculture, including an overview of commercial satellites and associated costings. The presentation will include a detailed discussion of applications currently being developed by the Agricultural Remote Sensing Team at UNE, in response to industry demand, ranging from the prediction of fruit size and yield at the individual tree level, the automated derivation and distribution of yield and nitrogen concentration maps to an entire industry and the generation of tools that support national biosecurity and post disaster monitoring.



Andrew Robson receiving the Poggendorff award from His Excellency General The Honourable David Hurley AC DSC (Ret'd), Governor of New South Wales

HOLD this Date:

Wednesday, 29 November 2017, 9 – 5:30 pm
for

The Royal Society of NSW and Four Academies Forum

“The Future Of Rationality In A Post-Truth World”

Government House, Sydney

The Forum’s participants will examine the societal implications of “post-truth” appeals to personal belief, in which opinion and the cherry picking of “facts” – true or false – are used to reach desired conclusions. This approach starkly contrasts to modern rationality, which is rooted in ancient Greek philosophy, the Renaissance, and the Enlightenment. Rationality assumes that the human mind has the capacity to analyse systematically-collected data and build logically-consistent knowledge that is continually subject to refinement through critique and empirical testing.

Science Week: Joint Meeting with UNE

For Science Week, the Society joined with the University of New England’s Parramatta branch to conduct a symposium focused on “education for all.” Introduced by Mr. Robert Field, Director of UNE’s Future School, Em. Professor Hibbert gave a brief opening address.

Professor E. James Kehoe from the School of Psychology, UNSW spoke on advances in evidenced-based instructional design. He emphasised the demonstrated value of self-paced, active study of worked examples and self testing to avoid overload, build confidence, and promote organised knowledge, rather than rote memorisation. Short talks were also give by Mr. Charles Richard Greenaway on “Connectivism” and Mr. Richard Davies on “Theory X vs. Theory Y.” There then followed a convivial discussion over afternoon tea.

.....Continued from Page 2

President's Column

Professor John Murray (UNSW and the Cancer Council) kicked off with a review of health statistics and cigarette smoking. Smoking has declined, fuelled by the various measures passed by government, banning advertising, plain packaging and the like. Still thirteen percent of Australian adults smoke with attendant risks of adverse health outcomes.

Dr Kathleen Riley updated (who can forget her OGM talk last year?) her fascinating deconstruction of the dancing of Fred Astaire. Channelling ancient Greek forms, Astaire was the perfect epitome of a dancer who embraced the new medium of cinema.

We watched him dance on walls and ceilings https://www.youtube.com/watch?v=RU_hFQg700s and heard of his careful attention to detail of creating seeming spontaneity.

Prof. Leslie Burnett FRSN of the University of Sydney and Kinghorn Centre for Clinical Genomics gave possibly the best talk of the week on whole genome, all the three billion base pairs, analysis. The possibilities, for example, for warning of potential conditions, understanding ancestry and evolution, and determining optimum dosages of pharmaceuticals were exceptionally clearly explained. As one of the only three laboratories capable of this analysis, Professor Burnett showed that Australia really does lead the way in this rapidly evolving field. In this regard,

catch the ABC program "Ask the Doctor" which aired on 4th July that explored this field.

My own contribution was a talk on Scientific Fraud, "Crooks, Cranks and Charlatans", one of my traditional talks being brought up to date with some interesting examples of modern-day fraud and 'false news'. The much talked about 'Climategate' affair of the University of East Anglia turned out to be entirely a non-event when investigated by eight independent bodies, but still scientists, driven by job and peer pressure, seem to commit research malpractice on an occasional basis. I like to think that the RSNNSW provides some kind of bedrock of true commitment to our investigations of what the World is truly like.

Finally, if you can, please come to the Poggendorff lecture on Tuesday 29th August. See elsewhere in the Bulletin for details, but Andrew Robson is an exceptionally engaging lecturer who will tell us about remote sensing and the future of agriculture. This will also be our first formal event at the Sydney Mechanics' School of Arts (SMSA), where soon after we shall be starting a series of lectures on "Is the Enlightenment Dead?" There will be tea and biscuits and possibly a glass of wine.

Particular thanks this month to organisers Ian Wilkinson FRSN for Science Week, Mohammad Choucair MRSN for the Poggendorff lecture, and Bob Clancy FRSN for the Enlightenment.

As usual, please write with comments and suggestions to president@royalsoc.org.au.



Welcome to
New Members

← Hans Pols
Tamson Pietsch →



Schedule of RSNSW Meetings 2017

Date	Event	Speaker	Topics and Presentations	Location
6-Sep-17	Ordinary General Meeting	Dr. Helen Mitchell Conservatorium of Music	Complexity of Music	Union, University & Schools Club
4-Oct-17	Ordinary General Meeting	Prof. Pip Patterson	Science of Social Networks	Union, University & Schools Club
1-Nov-17	Ordinary General Meeting	Pamela Griffith FRSN	Women in Art	Union, University & Schools Club
29-Nov-17	2017 Forum	Many Distinguished Scholars	The Future of Rationality in a Post-Truth World	NSW Government House
6-Dec-17	Ordinary General Meeting	Jak Kelly Award Winner	2017 Jak Kelly Award Presentation & Christmas Party	Union, University & Schools Club

RSNSW - Southern Highlands Branch

Date*	Event	Speaker	Topic	Location**
28-Sep-17	Public Lecture	Prof Peter Schofield	Alzheimer's Disease	Chevalier College, Bowral
19-Oct-17	Public Lecture	Prof Dean Rickles	Quantum Gravity	Chevalier College, Bowral
16-Nov-17	Public Lecture	Yik Lung (Jeremy) Chan	Effects of Maternal Cigarette Smoke Exposure	Chevalier College, Bowral

*Lectures are usually the third Thursday of each month, except September. **Location may change

RSNSW & The Sydney Mechanics School of Arts

Date*	Event	Speaker	Topic	Location**
4-Sep-17	Public Lecture	Susannah Fullerton	Samuel Pepys, His Library and the Enlightenment	Sydney Mechanics School of Arts***
6-Nov-17	Public Lecture	John Gascoigne	What the Enlightenment Meant to Australia	Sydney Mechanics School of Arts***
1-Feb-18	Public Lecture	Kim McKay	Learning, Adaptation and the Enlightenment: The Museum	Sydney Mechanics School of Arts***
1-Mar-18	Public Lecture	Paul Brunton	Learning, Adaptation and the Enlightenment: The Library.	Sydney Mechanics School of Arts***
5-Apr-18	Public Lecture	George Paxinos	Sophistry: "Global Deflation: The Enlightenment has Failed!"	Sydney Mechanics School of Arts***

***Mitchell Theatre, Level 1, Sydney Mechanics School of Arts, 280 Pitt St, Sydney

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