



# The Bulletin 402

The Royal Society of New South Wales

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29 August 2016

## For Your Diary:

Thursday, 18 August 2016  
Southern Highlands Branch  
Lecture

Assoc Prof Tony Masters

“From Sand and Rice Bubbles  
to Earthquakes and  
Volcanoes”

6:30 pm start  
Chevalier College, Bowral

Wednesday 5 October 2016  
1247th OGM

Prof Itai Einav

“From Sand and Rice Bubbles to  
Earthquakes and Volcanoes”

6:00 pm for 6:30 pm  
Union, University & Schools Club  
25 Bent St, Sydney



**Patron of The Royal Society of NSW**  
His Excellency General The Honourable  
David Hurley AC DSC (Ret'd)  
Governor of New South Wales

Public Lecture & 1246<sup>th</sup> OGM  
Wednesday, 7 September 2016

**Mr. Richard Neville**

Mitchell Librarian and Director, Education & Scholarship

“A Source of Inspiration and Delight:  
The Mitchell Library”



Richard Neville, as the Mitchell Librarian and Director Education & Scholarship at the State Library of NSW, has been extensively involved in the acquisition, arrangement, description, and promotion of the Library’s renowned Australian research collections. With a research background in nineteenth century Australian art and culture, he himself has published widely on colonial art and society.

*(For more information, go to page 7)*

**Date:** Wednesday 7th September 2016: 6:00 for 6:30 pm

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

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

**Dress:** Jacket and tie

**Dinner (including drinks):** \$80 for Members and Associate Members, \$90 for Non-Members. Reservations must be made at least 2 days before.

**Reservations:** <https://nsw-royalsoc.currinda.com/register/event/22> Enquiries:  
[royalsoc@royalsoc.org.au](mailto:royalsoc@royalsoc.org.au) Phone: 9431 8691

**All are welcome.**

# Report of 1245<sup>th</sup> OGM, 3 August 2016

Dr Barbara Briggs

Honorary Research Associate, Royal Botanic Gardens

## "Celebrating the 200<sup>th</sup> Birthday of Royal Botanic Gardens: a Personal History of 57 Years of Science"



The Royal Botanic Garden is both an enduring feature of the Sydney landscape and the oldest continuing scientific institution in Australia. Dr. Barbara Briggs, herself a long-serving researcher at the Garden, provided an engaging description of its 200-year history and prospects.\* She herself joined the staff in 1959, shortly after the Garden received Royal patronage.

The site of the Garden was an important space well before European arrival. It was an initiation ground of the Cadigal traditional owners, named Woccanmagully. From 1788 to 1807, the optimistically-renamed Farm Cove was used haphazardly and largely unsuccessfully for farming. In 1807, Governor William Bligh began removing private buildings to create the 'Demesne' (Domain). Subsequently, Governor Lachlan Macquarie continued this process and completed the roads started by Bligh, including Mrs Macquarie's Road, which was finished on 13 June 1816. That date is traditionally observed as Foundation Day for the Botanic Garden.

The Garden has evolved in its look and feel over the centuries. The Garden originally featured sculptures prominently. Sculptures – old and new – can still be found throughout the Gardens. From 1862 to 1882, Sydney's first zoo operated in the Garden. From 1879 to 1882, a "palace" was located in the Gardens for an international exhibition. It met the same fate as London's Crystal Palace by burning to the ground. However, the Palace Gates in Macquarie Street survive as a reminder of that short era.

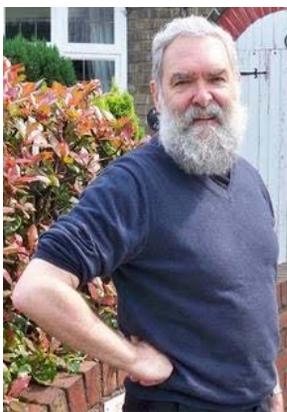
Less visually obvious, but no less important, the Garden has served as a source and preserve of botanical knowledge for nearly as long. Allan Cunningham was named as King's Botanist in December 1816 and served the Garden in various capacities until 1837. Charles Fraser was named the Colonial Botanist and Superintendent from 1817-1831. Some of Fraser's writings on botany were published as early as 1821. Other long-serving Directors included Charles Moore (1846-1896), who established a Public Botanical Library and the Herbarium collection in 1851-1852. Moore also initiated lectures on plants in 1851, decades before the founding of the faculty of science at the

*Continued on page 7*



The Garden Palace by from the Photograph Collection of Australia

# From the President



In August the Royal Society of New South Wales contributed again to the Sydney Science Festival. Organised by our excellent Chair of the Events committee Ian Wilkinson, four wide-ranging talks informed and delighted about a hundred and fifty people. The talks are reviewed later in the Bulletin, but the response of Sydneysiders coming to listen to us in their lunch hours showed that there is a great appetite for interesting science delivered by top practitioners in an entertaining way.

After presenting my Science Festival talk on Wednesday (17th August), I was invited to give the toast to the Academy of Forensic Sciences at its meeting that evening. Giving my greetings from the Royal Society of New South Wales and congratulating recently-elected RSNSW Fellows from the Academy, Professors James Robertson and Claude Roux, I observed “In a world where paucity of clear, evidence-based, thinking meets an overabundance of polemic, unfounded belief, and sheer madness, the Royal Society is trying to rally sensible people interested in their situation in the Universe.” Somehow with recent events in Australia and the world, I think this is entirely pertinent. The Academy was then informed of the new elements (mentioned here in my June column) and given the story of Davy’s discovery of iodine in the middle of the

Napoleonic war (see <https://www.science.unsw.edu.au/news/how-discover-new-element>). Hopefully we will see more forensic scientists, and indeed lawyers, join the RSNSW.

A highlight of the Science Festival talks was “Complex Systems and Swarm Intelligence” by Mikhail Prokopenko FRSN, perhaps a taster of his Forum presentation. Mikhail is in the news for leading the team that won the RoboCup 2D Simulation League in which eleven-a-side autonomous agents play virtual soccer. The Australian team (program?) beat a Japanese side 2-1 in the fifteen minute final, taking inspiration from the swarm behavior of schools of fish (See <https://theconversation.com/how-we-evolved-a-winning-strategy-for-the-robocup-competition-by-imitating-nature-63506>).

We also congratulate the Royal Botanic Garden on its 200th anniversary, and thank Barbara Briggs for her talk at the August OGM, and then Dr Brett Summerell for his contribution to the Sydney Science Festival.

This month following the OGM I was pleased to send letters of congratulation to our seven new Fellows: Associate Professor Roger Read, Professors James Robertson, Ian Jacobs, Emma Johnston, and Helen Irving, Dr Robert Young, and Emeritus Professor Stephen Gaukroger. I look forward to presenting their Fellowship certificates at an OGM. Somewhat belated congratulations should also go to Professor Justin Gooding FRSN, for his election to Fellowship of the Academy of Science.

As ever news, plaudits or abuse, please, to [President@royalsoc.org.au](mailto:President@royalsoc.org.au).

August 2016

Brynn Hibbert

# Report of 18 August 2016 Meeting

## Royal Society

### Southern Highlands Branch



Ian Skinner

**Speaker: Ian Skinner, NeuRA Australia**

## **Topic: Pain: What Is It? Why Do We Experience It? How Do We Experience It? What To Do About It?**

With such an open and intriguing title for this lecture, it was hardly surprising to see the enormous interest it created in the community as judged by the 65 audience members attending to hear Ian Skinner. Chronic pain is a massive, growing public health issue, with 1 in 5 Australians living with chronic pain today. When not conducting research, Ian works at a Private Pain Clinic as a physiotherapist implementing current best practice for acute and chronic pain management.

Ian described pain as an unpleasant and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. It seems that changing the way we think about pain, and our perception of it, may be a key factor in bringing relief to those with chronic pain. Pain is an adaptive response, and is our brain's way of alerting us to a potential threat. Understanding all the sources of that threat is often enough to reduce pain intensity and help recovery.

NeuRA is an independent, not-for-profit research institute based in Sydney, Australia. Its goal is to prevent, treat and cure brain and nervous system disease, disorders and injuries through medical research. Ian's main interest lies in investigating the role of cognitive bias in the development of low back pain. His hypothesis is that a subgroup of people who have recently injured their backs will continue to experience pain as a result of their cognitive processing. Specifically, some people may pay more attention to their back pain, a behavior that results in a poor recovery.

Ian also commented on a recent international study in which NeuRA participated. This study examined the relationship between chronic back pain and the volume of grey matter in particular areas of the brain in 111 people with chronic back pain and 432 healthy controls. The technique used was voxel-based morphometry, a non-invasive neuroimaging technique which allows researchers to investigate the structure of the brain.

Ian spent a great part of the lecture discussing the hugely subjective nature of pain across a range of individuals. He demonstrated many studies that are clearly showing that the context of a noxious stimulus affects the pain it evokes. For example, in the study of light colour (red or blue) on participant response, it was clearly shown that participant responses regarding pain unpleasantness and intensity were heightened when associated with the colour red, and lessened under blue conditions, although the stimuli used were identical but for the light colour. A common example of this phenomenon is also seen when a person receiving an injection reports more pain when they are looking directly at the needle, rather than away.

The study showed that people with chronic back pain had decreased volume of grey matter in areas of the brain associated with producing pain, for example, areas associated with the anticipation and unpleasantness of pain, as well as emotional regulation and cognitive processing. This would lead to the conclusion that brains of people who have back pain for a long time process everyday experiences differently from those who do not have pain. Clearly, another verdant field for research into pain, and its effect on the human brain.



**Anne Wood FRSN**

# Royal Society of New South Wales Sydney Science Festival Lunchtime Talks

## **Talk 1: “Complex Systems and Swarm Intelligence”**

**Professor Mikhail Prokopenko**

**University of Sydney**

**Friday 12 August 12.30 – 1.30pm**



Prof. Mikhail started by distinguishing complicated from complex systems, the latter being self-organising and having emergent properties. They are also not subject to any central control or design. Their behaviour depends on how the actors involved interact. These rules can be quite simple yet produce surprising patterns like the dynamic schooling behaviour of fish or the building of a termite nest. Mikhail explained how the flow of influence or information within such a system takes place, how it relates to artificial intelligence and how these insights were used by his team sent to the 2016 World RoboCup – a simulated football game.

## **Talk 2: “The Royal Botanic Gardens 200<sup>th</sup> Birthday”**

**Dr Brett Summerell**

**Royal Botanic Gardens**

**Tuesday 16 August 12.30-1.30pm**



Dr. Brett described the beginnings of the Gardens and how the site has changed over the years. We learned about the way the science agenda has developed over time, the nature of the valuable collections they have, and the important research they are and have been involved in.

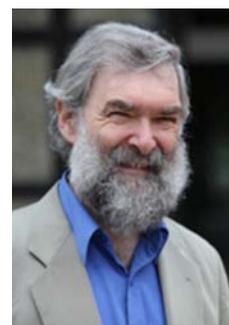
## **Talk 3: “Courts, Criminals and Chemistry:**

**Forensic Science in NSW”**

**Emeritus Professor Brynn Hibbert**

**President of the Royal Society of NSW & UNSW**

**Wednesday 17 August 12.30 to 1.30pm**



Emeritus Professor Brynn Hibbert FRSN, President of the Royal Society of New South Wales, has an apparently inexhaustible supply of anecdotes from his nearly 30 year career as an expert witness in the Australian criminal and civil courts. He specialises in drug cases, whether drugs of abuse or sport’s drugs (humans, horses and greyhounds), and has brought his knowledge of analytical chemistry (retiring from Australia’s only Chair of Analytical Chemistry in 2013), and applied statistics to bear on society’s struggle with illicit chemical substances.

Professor Hibbert believes that science is not suited to the adversarial court system, being usually a collaborative exercise, and the increasing complexity of scientific evidence often leaves the courts in a fog of incomprehension. However, as a self-confessed ‘old white male with a beard,’ he clearly offers courts exactly the kind of professorial gravitas that they expect. He is a supporter of harm minimisation strategies, and some decriminalisation for human drug use, citing statistics on drug arrests that show no slackening of use of a range of chemical molecules to provide mind-altering stimulation. Perhaps the CSI-effect is waning but real science still is of great importance to our legal system.



Professor Hibbert holding forth in his talk

#### **Talk 4: “Community-driven Internet of Things: The New Revolution?”**

**Professor Pascal Perez**

**University of Wollongong**

**Thursday 18 August 12.30-1.30pm**



Pascal explained how the Internet of Things (IoT) is misrepresented because the focus is on the things and ignores the people involved. He gave many examples of the way the IoT is pervasive and changing our lives. He also discussed both the benefits and dangers arising such as social inequities (financial and knowledge), privacy, "uberveillance" and security breaches. For example, he explained how a very big solar flare could have devastating effects. He provided a detailed example of a recent project in which crowd-sourced information from mobile phones and Twitter feeds has changed the way Djakarta can know about and deal with flooding disasters. Lastly, he told us about a new type of disruptive technology.



*Continued from page 1*

## **Mr. Richard Neville & Mitchell Library**

The State Library of New South Wales can trace its history back to 1826. In many ways its history and development runs in parallel to that of the Royal Society of New South Wales. Its first iteration was as a private gentleman's library, with a male only membership. Gradually its remit expanded, supported by a sense that libraries were institutions necessary for the public good, but it struggled to survive as a private organisation. Eventually the NSW Government stepped in and purchased it in 1869, when it became the Free Public Library. In this transition it threw away its editions of Jane Austen, and focused on useful, economic, knowledge.

From 1869 to today the Library, now known as the State Library of NSW, has embedded itself into the cultural life of NSW. The bequest of David Scott Mitchell in 1907, which led to the inauguration of the Mitchell Library in 1910, and the various

bequests of Sir William Dixson, were seminal gifts which established the Library as the premier documentary collection in the country. The library also holds some of the early archives of the Royal Society of NSW.

People are often surprised to learn that the Library collection houses photographs, manuscripts (more than 12 linear km of them, recording the early discovery of the Pacific through to the colonisation of Australia through to the archives of contemporary organisations and individuals), paintings, maps, architectural plans as well as books. Increasingly the Library is grappling with digital culture and collecting.

The future of libraries is much debated, but the future for the State Library and its Mitchell Library is very strong. The Library's archives and publications are critical in telling the story of Australia's history, and this talk will explore its history and development, the motivations and drive for which are no doubt very similar to those that drove the Royal Society.

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## **Dr Barbara Briggs & Botanic Garden**

University of Sydney until 1882 and its School of Botany in 1913. One of the listeners was Joseph Henry Maiden, who succeeded Moore and served as Director from 1896 to 1924. During that time, he presided over the development and management of a large collection of plant species, plus an insectarium (1910) to study plant pests. He was also twice President of the Royal Society of New South Wales.

Horticulture research was and remains a prominent feature of research by Gardens staff. Dr. Briggs noted that, for purposes of conserving our environment, there remains a continuing need to identify and describe previously-unrecognised plant species. In this respect, the well-known discovery of the Wollemi Pine is just a single example of these worldwide efforts. Between 2005-2009, the discovery of 9,932 plant species occurred. Among them are plants with very restricted environments.

One plant appears only on Mt. Kosciusko. In this connection, the additional gardens at Mount Annan and Mount Tomah were established for the conservation of species needing environments very different from the shores of Sydney Harbour. In the discussion after the talk, Dr. Briggs noted that the conservation of seeds is also a challenge. Freezing un-germinated seeds, as is done at the well-known seed bank on Svalbard, Norway, is not always feasible. Some Australian seeds germinate immediately with no dormancy period.

The lively discussion continued into the dinner afterward.



Wishing Tree c. 1816-1945, now site of Wollemi Pine

## Schedule of RSNSW Events 2016

Date	Event	Speaker	Topic	Location
7-Sep-16	1246th OGM	Mr Richard Neville, State Library of NSW	History of the Society	Union, University & Schools Club
5-Oct-16	1247th OGM	Prof Itai Einav	From Sand and Rice Bubbles to Earthquakes and Volcanoes	Union, University & Schools Club
13-Oct-16	Dirac Lecture	TBA	TBA	UNSW
2-Nov-16	1248th OGM: Jak Kelly Award	Prof. E. James Kehoe	Horses for Courses: Advances in Instructional Design	Union, University & Schools Club
17-Nov-16	AIP Postgraduate Awards Day	TBA	TBA	Slade Theatre, University of Sydney
29-Nov-16	Second Society Forum	Contributors from Learned Societies	Society as a Complex System	Government House
7-Dec-16	1249th OGM: Jak Kelly Award	TBA	TBA	Union, University & Schools Club

## Southern Highlands Branch - 2016

Date	Event	Speaker	Topic	Location
15-Sep-16	Lecture	Assoc Prof Tony Masters	Sustainability - Chemical Solutions for Tricky Problems	Chevalier College, Bowral
20-Oct-16	Lecture	Prof Gordian Fulde	Emergency Practice	Chevalier College, Bowral
17-Nov-16	Lecture	Prof. Gordon Wallace	3D Printing of Body Parts	Chevalier College, Bowral

*Future lectures and other events will be scheduled, usually for the third Thursday in each month*

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