

THE BULLETIN 452

THE ROYAL SOCIETY OF NEW SOUTH WALES

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June 2021

For Your Diary

- **07 JUL**1295th OGM and

 Open Lecture
- 22 JUL

 Ideas@theHouse: Music
 as a Superfood
- 04 Nov <u>RSNSW and Learned</u> Academies Forum 2021

1294th OGM and Open Lecture

Murray-Darling Basin turmoil: past, present, and future

Wednesday, 2 June 2021, 6:30 PM



Professor Richard Kingsford FRSN

Professor of Environmental Science Director, Centre for Ecosystem Science, UNSW (Sydney)

Date/time: Wednesday, 2 June 2021, 6:30 PM

Venue: Zoom Webinar Entry: No charge Enquiries: via email

All are welcome.

See <u>page 4</u> for more information



Patron of The Royal Society of NSW Her Excellency The Honourable

Margaret Beazley AC QC Governor of New South Wales

From the President

During the six weeks since I was elected President, I have been conducting a listening tour with as many Councillors, Members and Fellows as possible. I have also ventured further afield, speaking to former Presidents of the Royal Society of Edinburgh and the Royal Society of London. Looking back over my calendar since o7 April, I counted 30 one-hour interviews — more are scheduled. I am asking for thoughts about the identity and role of the RSNSW in today's world and am pleased that so many agree on our value as a credible and authoritative space in which to debate the complex challenges confronting society.



Another large component of my time has been spent rejuvenating the <u>membership of our Committees</u>. The responses to both

undertakings have brought home to me the commitment of members to our Society, what it aims to achieve, and importantly what is still to come. When our new Council met for the first time on 19 May, it ratified the Committee membership that should be available by now on our website. The other main topics for discussion at the Council meeting were the Report by the Treasurer and the establishment of a new Branch in Western NSW.

The Treasurer noted that the Society's current projected income and expenditure for 2021 yields a revised deficit of \$50,000 that we need to minimise. You will have received my invitation to donate generously to one contributor to the deficit: the costs of staging the Society's Bicentennial Exhibition at the State Library of NSW, which opens at the end of June and runs for five months. This Exhibition begins a year of celebrations to mark the Society's contributions to the intellectual life of NSW over 200 years. It is the perfect moment to reinforce our commitment to enriching lives through knowledge and inquiry. As we think about our future, we are informed by our history. As I said in my letter sent to all members on 12 May, many of you have been unstinting in helping us in the past with our library and archive restoration work. We are now asking for your help again. The donations will be used to help with costs associated with the all-important Exhibition and our plans to restore more of the Society's 200-year-old collection.

At the Council meeting, the Branch implementation working group comprising John Hardie, Christina Slade and George Willis reported on progress towards the establishment of a new branch that corresponds geographically with the Charles Sturt University campuses across regional NSW. Charles Sturt University is committing its full support for the proposal, including through the provision of its facilities for meetings and events at no cost. The full proposal and business case for the new Branch will be presented to the next meeting of the Executive Committee in June.

From the President (continued)

Finally, I encourage you to mark your calendar with the date for this year's RSNSW + Learned Academies Forum, which will be held live at Government House and live streamed across NSW on Thursday o4 November. This year's theme 'Power & Peril of the Digital Age' is attracting a lot of interest. Cathy Foley, Australia's Chief Scientist, Hugh Durrant-Whyte, NSW Chief Scientist & Engineer, and Edward Santow, Australian Human Rights Commissioner, are but three in the line-up of impressive speakers. The day will be moderated by Ian Oppermann, NSW Government Chief Data Scientist. Our State Librarian, John Vallance, has agreed to stream the Forum to live audiences in libraries across NSW. This is a model that could be replicated in many other venues. I encourage you to consider this idea of convening a local group in your sphere of influence to watch the Forum.

Susan M Pond AM FRSN FTSE FAHMS President, Royal Society of NSW

Welcome to new members

The Society is pleased to welcome the following new members to the Society. They were elected at the Ordinary General Meeting held on 5 May 2021. We hope that each of you enjoys your membership and is able to participate in all that the Society has to offer.

Fellows

- Professor John Willian Oman Ballard
- Ms Frances Bodkin
- Dr Jennifer Buckingham
- Professor Catharine Siobhan Coleborne
- Professor Judith Margaret Dawes
- Professor Ofer Gal
- Professor Jennifer Mary Gore
- · Professor Gordon Clifford Grigg
- Professor Janet Elizabeth Nelson
- Ms Anne Maria Nicholson
- Dr Samantha Richelle Oakes

- Professor Laura Poole-Warren
- Professor Simon Peter Ringer
- Dr Jackie Leach Scully
- Professor Mark Gerard Stewart
- Dr Laurence Patrick George Wakelin
- Associate Professor Qilin Wang
- Emeritus Professor Ian William Webster

Members

- Mr Philip Bailey
- Mr Jordan Gacutan
- Mr Brian Spilsbury

1294th OGM and Open Lecture

Murray-Darling Basin turmoil: past, present, and future

Professor Richard Kingsford FRSN

Professor of Environmental Science Director, Centre for Ecosystem Science, UNSW (Sydney)

Date: Wednesday, 2 June 2021, 6:30 PM

Venue: Zoom Webinar (Obtain help in getting started with Zoom)

Entry: No charge Enquiries: <u>via email</u>

All are welcome.



The Murray-Darling Basin is Australia's most developed river system, supporting extensive irrigation industries, pastoralists, traditional owner communities, fishers, tourism, and ecosystems. More than a century of river development through the building of dams, development of floodplains, and diversion of water has had devastating impacts on ecosystem services and ecosystems. The Millennium Drought was a catalyst for change. The Australian Government took over control of the Basin with the Water Act 2007, implemented by the Murray-Darling Basin Plan. The Commonwealth Government's external powers, particularly in relation to wetlands of international importance under the Ramsar Convention and migratory shorebirds were the primary driver for this, but States still remained in control of their rivers under the Federal Constitution, through their planning. A principal objective was to restore the health of the Murray-Darling Basin River system.

More than 13 billion dollars later, there are many challenges and questions about what has been achieved and at what cost. The number of inquiries continues to rise. The NSW Government is planning to build three large dams and smaller weirs on the rivers. Unfortunately, the ecological state of the Murray-Darling Basin continues to decline, albeit potentially at a slower rate than would have occurred otherwise. In this talk, Professor Kingsford will present his research on wetlands and waterbirds within the context of these major changes, past and present, as well as identify some of the major challenges for the future.

About the speaker

Professor Richard Kingsford is a river ecologist and conservation biologist who has worked extensively across the wetlands and rivers of the Murray-Darling Basin. He also worked with many different communities and governments across this region. His research has influenced the policy and management of rivers in Australia, including through his involvement on state and federal advisory committees. He also leads a reintroduction or rewilding project, Wild Deserts, in Sturt National Park (NSW). He is the Director for the Centre for Ecosystem Science UNSW, Sydney. He became a Fellow of the Royal Society of NSW in 2018.

Report: Southern Highlands Branch May Lecture

by Anne Wood

Burnout — the hottest issue Professor Gordon Parker AO

Date: Thursday 20 May 2021, 6:30 PM **Venue**: RSL Mittagong (face-to-face)

The event

The dramatic opening words of this fine lecture were 'I did not die, yet nothing of my life remained' — words from Dante as quoted by Grahame Greene in his book 'A Burnt-Out Case'. Parker then went on to give his audience an exhaustive analysis of his research into the condition of burnout which is so commonly observed in our society.



The biology of burnout can be readily described. There is sustained activation of the sympathetic-adrenal-medullary system, a feature which Parker likened to the over-revving of a car. Studies variably show high (or more commonly low) cortisol levels; reduced neurogenesis, especially in the hippocampus — the region for memory and emotional regulation — and in the frontal lobes. Also seen is reduced neuroplasticity. Structural changes too are observed such as the decreased volume in certain brain regions. From a functional point of view, disconnections between amygdala and other brain regions are evident. There is also noted compromise in the immune systems leading to increased rate of infections.

As regards the commonly reported incidence rates and costs to communities, Parker stated that across workplaces, the risk of developing the condition is 30%. In doctors, prevalence is estimated at 40–70%; also at any one time, it is estimated that one-third of doctors have burnout. In 2016, the World Economic Forum in Davos estimated the cost at \$332 billion/year — reflecting absenteeism, presenteeism and people leaving the workplace.

Professor Parker discussed the current treatments and recommendations for patients with burnout, outlining the many triggers that may have led to the condition. He observed that the most common driver in his diathesis stress model for burnout is perfectionism (which may be associated with workaholic behaviour), followed by Type A personality.

His conclusion to this lecture was optimistic. He stated that against his expectations, findings made by his group suggest that most patients do quite well — subject to the adoption of management strategies covered in this lecture, and subject to the correct diagnosis of 'burning out' or 'burned out' at the outset of treatment.

(continued overleaf)

Report: Southern Highlands Branch May Lecture (continued)

About the speaker

Professor Gordon Parker AO is Scientia Professor of Psychiatry, UNSW, was Founder of the Black Dog Institute and its initial Executive Director, Head of the School of Psychiatry at UNSW and Director of the Division of Psychiatry at the Prince of Wales Hospital. His positions with the Royal Australian & New Zealand College of Psychiatrists include being Editor of its journal. Positions with legal organisations include the NSW Guardianship Board and the NSW Administrative Appeals Tribunal. In 2004, he received a Citation Laureate as the Australian Scientist most highly cited in 'Psychiatry/Psychology'. In 2018, he received the prestigious James Cook Medal from the Royal Society of New South Wales, and was recipient of the 2020 Australian Mental Health Prize. His research has focussed on the mood disorders. He has published 23 books and over 1,000 scientific reports.

His first work of fiction was published in 1966 and his latest novel ('In Two Minds') in 2017. In the '60s, he wrote for The Mavis Bramston Show and OZ Magazine, was an ABC Science broadcaster, a book reviewer for the *Sydney Morning Herald* and *The Australian*, and in 2004 had a play ('Personality Games') produced by La Mama in Melbourne. His autobiography 'A Piece of My Mind: A Psychiatrist on the Couch' was published in 2012. His co-authored book on burnout will be published on I July 2021.

Report: Hunter Branch

by Eugenie Lumbers (Branch Secretary)

The new committee of the Hunter branch met for the first time on 13 May. The president of the Royal Society, Prof. Susan Pond, and the secretary, Mr. Bruce Ramage were in attendance. Prof. John Aitken chaired the meeting. Other changes to the committee, besides the election of Prof. Aitken to the Chair, included the election of Prof. Natalie Thamwattana as Vice-Chair, and the re-election of both Prof. George Willis as Treasurer and Em. Prof. Eugenie Lumbers as Secretary. Prof. Steven Weller, Adj. Prof. Robert Whittaker, Mr. John Dunnett and Father Andrew Doohan were re-elected to the committee; the committee welcomed new members Prof. Brett Nixon and Prof. Alan Broadfoot. The President informed the Hunter branch committee of changes that affect the branches, including the need for a business plan and the new funding guidelines.

On 26 May, the Hunter branch co-hosted with the University of Newcastle a lecture by Prof. Alan Finkel, former Chief Scientist of Australia. The lecture, titled 'On readying our region for low emissions technology' was held at the Newcastle Conservatorium of Music from 5:30 PM. In addition, the meeting was streamed to all members of the Royal Society.

The next event is a lecture by Prof. Jason Sharples, 'Extreme bushfires and the age of violent pyroconvection', to be held on 30 June. It will be a face-to-face meeting, with the possibility of arranging a Zoom meeting for those unable to attend. Further details will be announced on the website.

Report: Events Committee

by Christina Slade (Chair of Events) and Lindsay Botten (Webmaster)

We are delighted to announce that the Events Committee, with the agreement of the President, is planning for a return to face-to-face meetings at the State Library, commencing in August. Our plan is to record the face-to-face presentations and make these available on YouTube, although without live streaming, at least for the present. In the interim, we will continue to be well served with online events.

The 1293rd Ordinary General Meeting included an address by the Chair of the NSW Independent Planning Commission and former Chief Scientist and Engineer of NSW, Emerita Professor Mary O'Kane AC FRSN FTSE, on the evening of 5 May on the topic of 'Big Bad Fires in NSW'. Her talk was a tour de force, bringing scientific rigour and vivid images to the story of the bushfires of 2019–20.

Hunter Branch

Dr Alan Finkel AO FTSE FAA, the former Chief Scientist of Australia, addressed the matter of '... readying our region for low emissions technology' at a joint University of Newcastle and Royal Society of NSW meeting held on 26 May.

Southern Highlands Branch

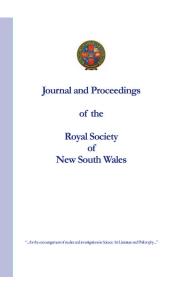
On **20 May**, Professor Gordon Parker AO, Scientia Professor of Psychiatry at UNSW Sydney, addressed the branch at the Mittagong RSL, speaking on the topic of 'Burnout — the Hottest Issue'.

Future events are listed on the website at <u>Upcoming Events</u>.

Journal & Proceedings of the Royal Society of New South Wales

by Robert Marks (Editor)

The Journal & Proceedings depends on its Editorial Board to help the Editor choose reviewers for any papers submitted for publication (that is, any papers not invited or reprinted or presented at the annual Forum). Over the years, members of the Board have been very helpful. The Editor also uses reviewers when deciding prizes, such as the Ollé Award for best paper published, and for the Warren Prize. In the June issue, we will be printing the names of all who have reviewed papers for the Journal since 2016. Thank you all.



Bicentennial Exhibition in the State Library

THE ROYAL SOCIETY OF NEW SOUTH WALES

NEXUS

ORIGINS ~ IDEAS ~ ADVANCES ~ IMPACTS

1821 - 2021

The Society is pleased to announce that it will be marking the beginning of its Bicentennial year by holding a special exhibition in the Jean Garling Room of the State Library of NSW from 26 June to 26 November 2021. Entitled 'Nexus', the exhibition will showcase aspects of the impact that the Society has had on the progress of intellectual inquiry and its application in NSW and Australia.

For 200 years, through various iterations, the Royal Society of NSW has been a nexus of ideas and discovery, challenging us to think differently, exposing us to the latest research and promoting awareness of some of the major issues confronting humanity. This exhibition showcases some of this activity through several key individuals who have had an impact, not only on the Society, but also on the community more generally. A tiny fraction of the Society's unique archives has been retrieved and will be displayed in this exhibition in order to tell the story of its Origins, Ideas, Advances and Impacts.

Entry to the exhibition will be free and it will be open to all Society members and the public three days a week at times to be announced shortly.

Volunteers needed

As the exhibition needs to be attended by Society members during its hours of opening, we are calling for members willing to offer a few hours a week as volunteers to answer questions from the public at the exhibition (training provided). If you would like to volunteer, please contact the Librarian, John Hardie, at john.hardie@royalsoc.org.au.

The Society thanks the State Library of New South Wales for its assistance in mounting this exciting and memorable exhibition.

Reminder: Help preserve the Society's archives

In early May, our President wrote to all members alerting us to the fact that the Society's archives are in need of preservation and restoration:

In June this year, we begin a year of celebrations to mark the Society's contributions to the intellectual life of NSW over 200 years. This is the perfect moment to reinforce our commitment to enriching lives through knowledge and inquiry. As we think about our future, we are informed by our rich past.



To mark the beginning of our celebrations, we are staging the exhibition, NEXUS (<u>page 8</u>), to showcase some of our contributions to the community over the past two centuries. The exhibition will present a small part of our archive for the very first time.

Our investigations in preparation for this exhibition revealed a valuable repository of Society material that is historically significant to NSW, including 77 boxes of important artifacts that require repair and conservation. We need to ensure that more of our precious items are preserved so they can be visible and admired as part of the State's cultural heritage.

The costs of staging the exhibition have created a significant deficit in our FY21 budget. Correcting this deficit and restoring more of the Society's unique historical artifacts will cost considerably more than we are currently able to afford.

Many of you have been generous in helping us in the past with our library and archive restoration work. As we mark our first 200 years, may I suggest that you make at least a \$200 donation to help with costs associated with the exhibition and our plans to restore more of the Society's collection. All donations over \$2 are tax deductible.

Donors will be invited to an exclusive tour of the exhibition, which will be on display in the State Library of NSW for six months from Saturday 26 June.

Donations can be made either by:

1. direct deposit to Account name: Royal Society of NSW Library Fund

BSB: 062-319

Account No: 10275175

Please insert your name and the word 'Archives' as reference.

OR

2. cheque made out to 'Royal Society of NSW Library Fund — Archives' and and sent to the Society at PO Box 576, Crows Nest, NSW 1585.

We thank those of you who have already donated to this worthy cause and thank in advance those who are planning to donate prior to 30 June to take advantage of the Library Fund's to take advantage of the tax deducibility in this financial year.

We look forward to seeing you at our Bicentennial Exhibition.

Dr Susan Pond AM FRSN President

Society Fellows elected as Fellows of the Australian Academy of Science

The Royal Society of NSW is delighted to learn of the recognition of two of its Fellows and one of its Distinguished Fellows as new Fellows of the Australian Academy of Science, elected in May 2021.

The Academy citation for Professor Susan Coppersmith FRSN FAA, of the School of Physics at UNSW (Sydney), recognises her outstanding contributions to several subjects in condensed matter, focusing on the fundamental nature of systems that are far from thermal equilibrium. She has developed theories unifying phenomena that are observed in areas as diverse as population biology, biomineralisation, granular materials, and superfluidity. Working closely with experimentalists, she has also made important contributions to the development of quantum dot qubits in silicon/silicon-germanium heterostructures.





The Academy citation for Professor Hala Zreiqat AM FRSN FAA FTSE FAHMS of the Faculty of Engineering at the University of Sydney notes that she has made significant contributions to biomaterials, regenerative medicine, and translational orthopaedic research. She introduced advanced cell, molecular biology and nanoscience approaches to the biomaterials field. Her team invented new bioceramics with outstanding strength and biological properties for the regeneration of large

bone defects. She has developed innovative technologies for 3D-printing these ceramics, enabling carefully controlled fabrication of complex structures with precisely defined shape, porosity, architecture and surface topography. These achievements are leading to the development of novel orthopaedic implants, including the world's first synthetic material for healing large bone defects under load, enabling personalised approaches to the repair and regeneration of musculoskeletal tissues.



The Academy citation for Sir Fraser Stoddart FRS DistFRSN FAA, as a Corresponding Member of the Academy, notes that he is a 2016 joint Nobel Laureate in chemistry and one of the few chemists during the past 35 years to have created a new field of chemistry: mechanostereochemistry. He pio-

neered the development of techniques now employed as molecular switches in the fabrication of molecular electronic devices and in the design and synthesis of artificial molecular machines. Corresponding Membership is a special category within the Fellowship, comprising eminent international scientists with strong ties to Australia who have made outstanding contributions to science. As of 2021, there are 34 Corresponding Members of the Academy.



The Council of the Royal Society of NSW extends its warmest congratulations to Professor Coppersmith, Professor Zreiqat, and Professor Sir Fraser Stoddart on this recognition of their outstanding scientific achievements. As Fellows of the Australian Academy of Science, they are among Australia's most distinguished scientists, elected by their peers for ground-breaking research.

Warren Prize winner: Dr Simon Devitt

The Warren Prize of the Royal Society of NSW has been awarded to Dr Simon Devitt of the Centre for Quantum Software and Information at the University of Technology Sydney. The Prize, which was awarded for the first time in 2020, recognises research of national or international significance by engineers and technologists in their early to mid-careers.

The judges were impressed with Dr Devitt's portfolio of achievements, including his publication in top-tier journals, and his activity in commercialising ideas in the realm of quantum computing through start-up

companies. Dr Devitt, who completed his PhD in 2007 at the University of Melbourne, has held positions at the National Institute of Informatics, Ochanomizu University, Keio University and Riken in Japan, and has worked as research fellow for the ARC Centre of Excellence in Engineered Quantum Systems (EQUS) at Macquarie University. He has developed key quantum computing architectures in atom-optics, diamond and ion trap systems, and invented quantum communications designs, second and third generation repeaters and the quantum sneakernet. Most recently, his work has focussed on the design of programming, compilation, and optimisation techniques for large-scale quantum technology.

The Society and social media

The Society's presence on social media platforms is slowly but surely growing. Our <u>Facebook page</u> and <u>YouTube channel</u> continue to attract and engage followers and viewers, and we continue to build a repository of online events conducted recently on YouTube.



The icons on the right will take the reader to the platforms' respective pages, from where they can follow and subscribe to the Society, and be notified of new content.



List of proposed events for 2021

Kindly note that this is a provisional list and will be subject to change. Updates will be reflected in future issues of the Bulletin and on <u>our website</u>.

Date	Event	
Wednesday, 2 June 6:30 PM AEST	1294 th Ordinary General Meeting and Open Lecture Murray-Darling Basin turmoil: past, present and future Professor Richard Kingsford FRSN	
Thursday, 17 June 6:30 PM AEST	(Southern Highlands Branch) Nuclear Fusion — exact topic t.b.a. Max La Galle	
Wednesday, 30 June 4:30 PM AEST	(Hunter Branch) Extreme bushfires and the age of violent pyroconvection Prof Jason Sharples, UNSW, Canberra Director of the Bushfire and Natural Hazards CRC	
Wednesday, 7 July 6:30 PM AEST	1295 th Ordinary General Meeting and Open Lecture Society as an information-processing system, and the influence of the media Dr Erik Aslaksen FRSN	
Thursday, 15 July 6:30 PM AEST	(Southern Highlands Branch) Neutron scattering and the WOMBAT project Dr Helen Maynard-Casely	
Thursday, 22 July 6:30 PM AEST	Ideas@theHouse: 'Music as a Superfood: How music can help us live longer, sleep better, calm down, find flow, and feel happier' Greta J. Bradman	
Wednesday 4 August 6:30 PM AEST	1296 th Ordinary General Meeeting and Open Lecture Towards a Modern History of Gondwanaland Professor Alison Bashford FRSN FAHA FBA FRHistS, UNSW	
Wednesday 25 August	(Hunter Branch) Lecture — Royal Commission for Ageing and the care and welfare of the elderly Prof Kathy Eagar, University of Wollongong	

List of proposed events for 2021 (continued)

Date	Event	
Wednesday, 1 September 6:30 PM AEST	1297 th Ordinary General Meeeting and Open Lecture Taking humour and laughter seriously: Exploring the multi-disciplinary field of humour studies Dr Jessica Milner Davis FRSN	
Wednesday, 29 September	(Hunter Branch) Lecture — exact topic t.b.a. Nathan Towney, University of Newcastle	
Wednesday, 6 October 6:30 PM AEDT	1298 th Ordinary General Meeting and Open Lecture Ethics, regulation and AI (to be confirmed) Professor Toby Walsh, Laureate and Scientia Professor, FRSN FAAS FACM FAAAS FEAAI; Sarah Court, Commissioner Australian Competition and Consumer Commission	
Thursday, 4 November 9:00 AM–4:30 PM AEDT	Royal Society of NSW and Learned Academies Annual Forum Power and Peril of the Digital Age Venue: Government House, Sydney, Live Streaming and subsequent availability on YouTube	
Wednesday 10 November 6:30 PM AEDT	1299 th Ordinary General Meeting and Open Lecture Topic: To be announced Speakers: To be confirmed	
Wednesday 1 December 6:30 PM AEDT	1300 th Ordinary General Meeting and Open Lecture Managing Psychological Distress in Times of Stress: Handling the Stress of COVID-19 and All That Scientia Professor Richard Bryant AC FASSA FAA FAHMS — James Cook Medal Winner 2020	

Current Council and Office-Bearers

The current Council and office-bearers of the Society are:

Patron	Her Excellency The Honourable Margaret Beazley AC QC, Governor of New South Wales
President	Dr Susan Pond AM FRSN FTSE FAHMS
Vice-President	Ms Judith Wheeldon AM FRSN
Past President	Emeritus Professor Ian Sloan AO FRSN FAA
Secretary	Mr Bruce Ramage MRSN
Treasurer	Mr John Cameron MRSN
Librarian	Mr John Hardie FRSN
Webmaster	Emeritus Professor Lindsay Botten FRSN
Councillors	Professor Katherine Belov AO FRSN
	Ms Pamela Griffith FRSN
	Dr Donald Hector AM FRSN
	<u>Dr Davina Jackson FRSN</u>
	<u>The Hon. Virginia Judge FRSN</u>
	<u>Professor Eric Knight FRSN</u>
	Emeritus Professor Robert Marks FRSN
	Emerita Professor Christina Slade FRSN
Hunter Branch Representative	Professor George Willis FRSN FAA
Southern Highlands Branch Representative	Mr Mike Jonas MRSN

Editor: <u>Jason Antony</u>





