The Bulletin 397

The Royal Society of New South Wales

ABN 76 470 896 415 ISSN 1039-1843 30 March 2016

OPEN LECTURE, AGM, & 1242th OGM
Wednesday, 6 April 2016

Dr. Donald Hector
Presidential Address

Dr. Hector is the outgoing President of the Society, having successfully completed a term of four years. See his final report on the next page.

Union, Universities, & Schools Club, 25 Bent St, Sydney
***6:00 for 6:30 pm**, Welcome drink at 6:00 pm*
Fellows & Members $5; Guests, $20
Please note dress code: jacket and tie
All are welcome.
To register for the event and dinner afterward, please go to https://nswroyalsoc.currinda.com/register/event/16 or email the Society at royalsoc@royalsoc.org.au.

For Your Diary:

Thursday, 21 April 2016
Southern Highlands Branch Lecture

Scientia Professor Gordon Parker
"Winston Churchill, Bipolar Disorder, and the Dardanelles"
6:30 pm start
The Performing Arts Centre, Chevalier College, Bowral

Wednesday, 4 May 2016
Annual Dinner,
Royal Society of NSW 2016 Distinguished Fellows Lecture,
And Presentation of Awards

Emeritus Scientia Professor Eugenie Lumbers
"Science Policy and University Research"
Union, University & Schools Club
25 Bent St, Sydney
Please note dress: Black tie
6:30 pm for 7:00pm
(Book for the annual dinner: $95 per head)

See ***last page for a summary of Events scheduled so far for 2016***

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

From the President

This is the last report that I shall deliver as President of the Royal Society of NSW. It has been a great privilege and an enormous pleasure to have been President for the last four years and I am grateful to the membership for having given me this opportunity. It has been very satisfying to work with a group of people dedicated to seeing the Society re-emerge from a long winter and to re-establish itself as one of the leading intellectual organisations in Australia.

The challenges that face the Society are no different to those facing similar organisations world-wide. Greater focus and specialisation, extraordinary changes to the way in which information is shared, influenced particularly by the advent of the internet and social media, and the great diversity of interest groups all competing for attention have made many people question the relevance of old, established institutions like the Society. Some years ago, the Society adopted the motto *omnia quaereite* – question everything. And that is exactly the approach we took to think about the future of the Society.

We questioned, we discussed, we debated, and we consulted. We reached two conclusions: first, far from being irrelevant, the Society's broad remit of advancing knowledge in science, art, literature and philosophy, uniquely positions it to provide a meeting-place for people across these disciplines to share their knowledge, to socialise and to discuss interesting and important issues; and second, we concluded that the introduction of Fellowships was of fundamental importance to attract leaders in the community across these disciplines to become engaged in the Society's activities.

Both of these initiatives have been successful. The Society has achieved its strongest growth in membership for decades and, pleasingly, this is across all membership categories. Attendance at monthly meetings has also increased and is now consistently strong. And, most importantly, we have established strong working relationships with all four of Australia's national Academies – the first Royal Society of NSW and four Academies Forum hosted by the Society's Vice-Regal Patron and held at Government House in September 2015 was an outstanding success.

The Society's long-term viability is determined by financial stability and for some years the Society operated at a loss. This has gradually been reduced (although not as quickly as we had hoped), and we anticipate that this year the Society will have modest operating surplus.

As my term as President draws to a close I would like to thank the members of Council for the commitment and hard work that they have devoted to the Society over the last year (and much longer in some cases) – it is been a privilege working with you! I would also like to wish Brynn Hibbert, President-elect, every success in guiding the Society in the next phase of its renaissance. There is still much more to be done!

I look forward to seeing you at forthcoming meetings. As always, I can be easily contacted by email at president@royalsoc.org.au or dchector@royalsoc.org.au, and I would like to hear from you.

Don Hector

Report of 12 March 2016 Meeting
Royal Society
Southern Highlands Branch

Special Event: "An Afternoon with Chopin and George Sand"

Presented by Dr. Christian Heim & Dr. Caroline Heim

The most recent meeting of the Royal Society Southern Highlands Branch (RSSH) took place on the afternoon of Saturday 12 March, instead of at the usual time of 6.30pm on the third Thursday of the month. The committee decided after lengthy discussion to change the usual meeting time, after receiving a request from Drs Christian and Caroline Heim. The decision was not an easy one, especially as the time requested by the Heims was at the weekend…an unfamiliar scheduling for our members.

Fortunately, RSSH found huge support from local organisations who were pleased to offer addition publicity for the occasion. The Southern Highlands Opera Appreciation Group (SHOAG) emailed all their members of the upcoming event, and the Bowral sector of the Association of Australian Decorative and Fine Arts Societies (ADFAS) under Professor Clive Probyn was also extremely helpful. These organisations, together with our usual publicity machine, ensured that the Chopin afternoon performance attracted a very healthy audience of 85-90 people, despite the unusual performance time.

Drs Christian and Caroline Heim live in Brisbane, where Christian is a specialist doctor with a full clinical practice and Caroline holds a full time lecturing position at Queensland University of Technology. They flew to Bowral especially for "*An Afternoon with Chopin and George Sand*". The performance started at 1:30 pm, and the couple were on their way back to the airport at 3 pm.

It was difficult for them to get away on time as the response from the audience was overwhelming. People milled around the performers at the end of the performance, many of them openly in tears. The ovation that they had given Christian and Caroline was loud and long.

There is no question that Christian Heim's extraordinary Chopin performance on the Chevalier grand piano was an emotional and stirring experience, but when coupled with the

Continued on next page

(Continued from previous page)

"An Afternoon with Chopin and George Sand"

stage play of his wife as George Sand, depicting the turbulent relationship between the lovers, the experience can only be described as unforgettable.

Christian Heim is a composer. He wrote *An Evening with Chopin* especially for the pair. The RSSH, with Christian's permission changed the title slightly to *An Afternoon with Chopin* as it suited the Heims' request for an afternoon performance on this occasion.

In the introduction to the performance, Christian described the historical accuracy of the presentation, as he had researched comprehensively all of the spoken material which Caroline acted out as Chopin's music stormed all around her.

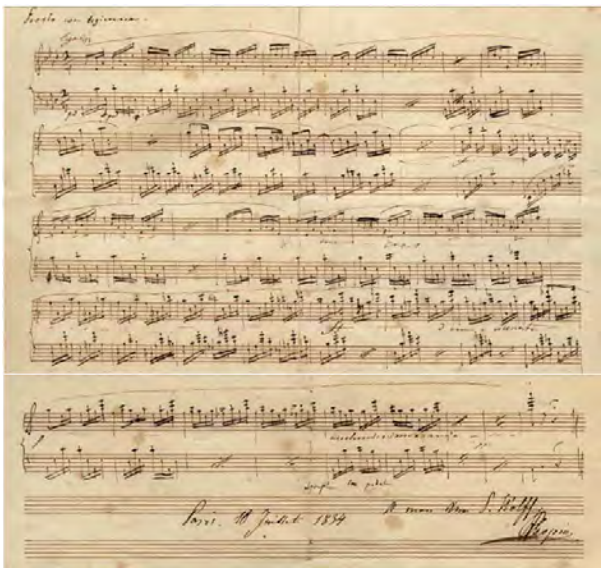
Christian studied music with Peter Sculthorpe, and also in Vienna, Paris and New York. As a Churchill fellow, he studied the healing uses of music in European hospitals. He has had his original music and theatre works performed in Australia and New York, and he has published on the benefits of music for dementia sufferers. His CD *Prayer Dances* can be heard on ABC classic FM.

Dr Caroline Heim has a Doctorate in Theatre Studies and is a lecturer at Queensland Institute of Technology and a free lance theatre critic for *The Australian*. She studied acting in New York and worked for 7 years on US stages winning a Drama League Award and receiving critical acclaim from *The New York Times*. Her first book *Audience as Performer: the Changing Role of Audiences in the Twenty-first Century* was published by Routledge last August. Both Caroline and Christian have produced theatre productions in New York, Sydney and Brisbane.

As Caroline and Christian rushed away to the airport, they promised to return soon for another stimulating lecture to the RSSH. On a previous visit, Christian delivered a lecture on his findings of the effect of baroque music on dementia patients. That too was a wonderful and thought-provoking presentation.

The RSSH Royal has been very fortunate to attract speakers of the caliber of the Heims. Most importantly, it has given us the rare opportunity to produce cross disciplinary lectures, with the arts and the sciences inextricably woven together.

Anne Wood



Chopin's Autograph of his Prelude 26 in A major
Wikipedia Commons, Public Domain

Report of 1241th OGM RSNSW
Wednesday, 2 March 2016

"How to Win an IgNobel Prize and Other Adventures in Communicating Science"

Dr. Len Fisher
University of Bristol

Dr Len Fisher FRSN presented a thought-provoking talk that focused primarily on his experiences in communicating an appreciation of science, especially physics and chemistry, to a diversity of important audiences. These include politicians, the general public, and students of all ages.

Dr. Fisher outlined complementary strategies for promoting science. He noted that often communicators emphasise the use of scientific knowledge to explain everyday phenomena that might otherwise be mysterious. Dr. Fisher's own IgNobel Prize research is an example of a serious effort to make science accessible by showing how scientists think about the little problems of everyday life. He received his prize for experiments and calculations regarding the optimal time to dunk dry biscuits in different fluids to maximise their flavour without losing their integrity.

Alongside this strategy of practical application, Dr. Fisher considered engaging an audience's interest in scientific knowledge *per se* by:

• Using a celebrity with a serious interest in science to explain it in an attractive way. The efforts of the noted actor Alan Alda come to mind in this connection.

• Conducting scientific research that is quirky enough to attract coverage by the general media. This attention can then be used as the departure point for explaining the underlying science. The publicity that Dr. Fisher received for his IgNobel Prize in 1999 would be an example of this tactic.

• Helping scientists become celebrities as they explain science in the public arena. Mathematician Dr. Jacob Bronowski, was an early, prominent example of an academic who became well-known through his 1970s BBC series "The Ascent of Man." Similarly, astronomer/astrophysicist Dr. Carl Sagan came to prominence in the USA through his series "Cosmos." Current examples of such individuals are Sir David Attenborough, the science-trained naturalist, and Prof. Stephen Hawking.

Dr. Fisher also canvassed the idea that science could be promoted as "fun." In the subsequent, lively discussion, several audience members noted the role that access to chemistry sets had and could play in engaging children in science.

Finally, Dr Fisher discussed why it is important to communicate science to a wide public audience. Among other things, Dr. Fisher noted that knowledge – or at least an awareness – of science could help guide consumer and government to make better-informed choices.

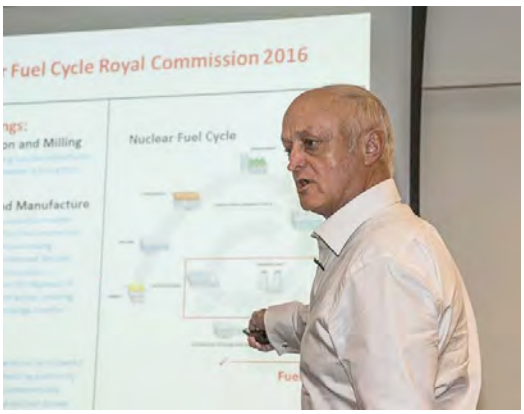
ANNUAL MEETING OF THE FOUR SOCIETIES

Thursday, 25 February 2016

"Energy Sources in Australia's Future"

Professor Robert Clark AO FAA FRSN

Chair of Energy Strategy and Policy, UNSW



Professor Robert Clark presented the Four Societies Lecture 2016 on the subject of energy policy. The Four Societies Lecture is presented annually by the Royal Society of NSW, the Australian Institute of Energy, the Nuclear Panel of Engineers Australia

Association.

Lecture 2016 on the subject of energy policy. As a

from the Paris climate change conference held in

initiatives to address climate change so far. A key point that came from the conference that will affect Australia is a massive investment in solar energy technology. Most notably, India and China have committed US$1 trillion to the development of solar energy technology over the next decade or two.

A further key point concerned reductions in carbon emissions. Australia has committed to emissions targets of a 5% reduction (compared to 2000 levels) by 2020 and, by 2030, a 26-28% reduction compared to 2005 levels. In addition, Australia has committed to a target of 24% of Australia's generation capacity to be renewable by 2020.

Nonetheless, German modeling shows that very large amounts of coal, oil and gas will be required to meet global energy demand at least until 2050 and probably well beyond then. Over the next 20 years, the urbanisation of India's population and the investment in baseload, coal-fired power generation capacity, even taking into account a large expansion of nuclear capacity, will result in a very substantial increase in coal-based CO2 emissions.

Australia's energy requirements are characterised by having very large amounts of liquid natural gas

However, Australia will continue to have a deficiency in liquid fuels – most of Australia's liquid fuels are imported.

Professor Clark has devoted several years to investigating a number of specific problems in the energy sector. He gave several examples of his work. Among them, one major user of liquid fuels is freight forwarding. The movement of freight accounts for 194 billion freight-tonne-kilometres per year. Of this, 151 billion are moved by B-double trucks, of which there are 84,000 in Australia. Converting these trucks from imported diesel to

(*continued next page)*

(Continued from previous page)

"Energy Sources in Australia's Future"

locally-source LNG would result in considerable reductions in carbon emissions. Specifically, LNG produces nearly 30% less carbon that diesel emits, for the same energy output. This conversion would also have a noticeable impact on Australia's liquid fuels balance and the current account for imports versus exports.

Professor Clark noted that the prospect of nuclear energy has been contentious in Australia. In the last few years, there has been a call to consider installation of substantial base-load nuclear generation capacity. Professor Clark noted that the future total Australian electricity generation requirement is about 250 terawatt-hours. If nuclear generation capacity were to provide 15% of this, it would require five 1,000-megawatt nuclear reactors – one near every major city. According to Professor

requirements of such an investment are probably insurmountable.

On the other hand, Australia could potentially lease its uranium for use in overseas nuclear generation

uranium could be tracked and ultimately returned to Australia for reprocessing or storage. Such leasing to existing and proposed plants would yield 10 times the reduction on CO2 emissions compared to building base-load generation in Australia. From Professor Clark's perspective, this case demonstrates the importance of adopting a global perspective on CO2 emissions and climate change, rather than a purely domestic perspective.

Professor Clark concluded by observing that there is still a need for substantive policy development in energy production. The recent Energy White Paper 2015 is more of a statement regarding the energy situation, than a policy document. An important point that emerged from Professor Clark's wide-ranging talk is that energy policy ultimately will need to address a complex mix of fossil fuels and renewable energy sources.

Professor Robert Clark is the Chair of Energy Strategy and Policy at UNSW. He has a distinguished career, having headed a research group in experimental quantum physics at Oxford's Clarendon Laboratory and was the Chair of Experimental Physics at UNSW. He has been head of the Australian Research Council (ARC) Centre of Excellence for Quantum Computer Technology at UNSW and has been Australia's Chief Defence Scientist (CDS) and CEO of the Defence Science and Technology Organisation.

The Four Societies Lecture is presented annually by the Royal Society of NSW, the Australian Institute of Energy, the Nuclear Panel of Engineers Australia (Sydney Division) and the Australian Nuclear Association.

Contacts for Your Officer Bearers and Council Members

Dr Donald Hector President: <president@royalsoc.org.au>
Em. Prof D. Brynn Hibbert Vice President: <b.hibbert@unsw.edu.au>
Mr John R Hardie Vice President: <john.hardie@royalsoc.org.au>
Ms Judith Wheeldon AM Vice President: <judith.wheeldon@mac.com>
Prof. Michael Burton Hon.Secretary (Editorial): < editor@royalsoc.org.au>
Hon. Secretary: <secretary@royalsoc.org.au>
Dr Ragbir Bhathal Hon. Librarian: <R.Bhathal@uws.edu.au>
Mr Hub Regtop (Southern Highlands Rep): <regtop@ozemail.com.au>
Dr Erik Aslaksen <erik.aslaksen@bigpond.com>
Prof Richard Banati: <rib@ansto.gov.au>

Dr. Herma Buttner: <herma.buttner@gmail.com>
Dr. Desmond Griffin AM: <desgriffin@optusnet.com.au>
Em. Prof Heinrich Hora: <h.hora@unsw.edu.au>
Prof. E. James Kehoe: <ejameskehoe@gmail.com>
Em. Prof Roy MacLeod: <roy.macleod@sydney.edu.au>
Prof. Bruce Milthorpe: <Bruce.Milthorpe@uts.edu.au>
Dr Frederick Osman: <fosman@trinity.nsw.edu.au>
Prof. Ian Sloan AO: <i.sloan@unsw.edu.au>
Prof. Ian Wilkinson < ian.wilkinson@sydney.edu.au>

The Bulletin is issued monthly by the Royal Society of New South Wales
Editor: Prof. E. James Kehoe; Managing Editor: Mr Edward Hibbert
Contact: Ms. Zoe Ballarin, Phone: +61 2 9431 8691 Fax: +61 2 9431 8677 Email: info@royalsoc.org.au
Mailing Address: The Royal Society of NSW, PO Box 576, Crows Nest NSW 1585, Australia

For further information: http://www.royalsoc.org.au/

Schedule of RSNSW Events 2016

Date	Event/Location	Speaker	Topic
06-Apr-16	**AGM + 1242nd OGM**	Dr. Don Hector	Presidential Address
	Union, University & Schools Club		
TBA	**Clarke Memorial Lecture**	TBA	TBA
	Union, University & Schools Club		
04-May-16	**Annual Dinner**	Prof. Eugenie Lumbers	Science Policy and University Research
	Union, University & Schools Club		
01-Jun-16	**1243rd OGM**	Prof. Peter Hiscock	Archaeologists in Film
	Union, University & Schools Club		
06-Jul-16	**1244th OGM**	Prof. Itai Ianev	From Sand and Rice Bubbles to Earthquakes and Volcanos
	Union, University & Schools Club		
03-Aug-16	**1245th OGM**	Mr Jimmy Turner, Royal Botanic Garden	TBA
	Union, University & Schools Club		
07-Sep-16	**1246th OGM**	Mr Richard Neville, State Library of NSW	History of the Society
	Union, University & Schools Club		
05-Oct-16	**1247th OGM**	Mr Rob Young	WB Clarke Biography
	Union, University & Schools Club		
02-Nov-16	**1248th OGM: Jak Kelly Award**	Prof. E. James Kehoe	Courses for Horses: Advances in Instructional Design
	Union, University & Schools Club		
17-Nov-16	**AIP Postgraduate Awards Day**	TBA	TBA
	Slade Theatre, University of Sydney		
07-Dec-16	**1249th OGM: Jak Kelly Award**	TBA	TBA
	Union, University & Schools Club		

Southern Highlands Branch - 2016

Date	Event/Location	Speaker	Topic
21-Apr-16	**Lecture**	Scientia Prof. Gordon Parker	"Winston Churchill, Bipolar Disorder, and the Dardanelles"
	The Performing Arts Centre, Chevalier College, Bowral		
19-May-16	**Lecture**	Dr. Kathleen Riley	"The Science of Spontaneity: Fred Astaire as the Consummate Craftsman"
	The Performing Arts Centre, Chevalier College, Bowral		
21-May-16	**Lecture**	TBA	TBA
	Chevalier College, Bowral		
16-Jun-16	**Lecture**	TBA	TBA
	Chevalier College, Bowral		

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

Letter to the Editor

To the Editor,

I wish endorse Dr. Aslaksen's comment in last month's RSNSW Bulletin about the key role of engineers in innovation and progress. Before being appointed to UNSW, I spent seven years in the industrial research centres of Zeiss, IBM, Westinghouse and Siemens. Consequently, I fully understand the difficulties faced by politicians with limited scientific-engineering experience who have to judge the relative merits of diverse, contending initiatives. One excuse for the lack of engineering for commercialising innovation in Australia is its comparably moderate weight within industrial powers due to its small size and being in a remote place. And nevertheless Australia has created pioneering scientific advances that are worthy of development by engineers.

Heinrich Hora FRSN
Emeritus Professor

Opinions expressed in letters to the editor are not necessarily those of the Royal Society of New South Wales.

Subject to conventional editorial discretion, letters received by the 15th of each month will be published on or abut the 24th of that month. Letters of 250 words or fewer are preferred.