



The Royal Society of New South Wales Bulletin and Proceedings 335

ABN 76 470 896 415

ISSN 1039-1843

May 2010

Future Events 2010

Lectures in Sydney are held in Lecture Room 1, Darlington Centre, University of Sydney at 7 pm on the first Wednesday of the month with drinks available from 6 pm.

Wednesday 2 June 2010 at 7 pm

Dr Peter Tyler – Royal Society of NSW Historian

Science for Gentlemen – The Royal Society in the Nineteenth Century

(see details at right)

Wednesday 7 July 2010 at 7 pm

Dr Fred Watson - Anglo Australian Observatory Pluto and the Ueber-nerds

Southern Highlands Branch

Meetings are held on the third Thursday of each month in the Drama Theatre at Frensham School, Mittagong (enter off Waverley Parade), at 6.30pm.

next talk

Thursday 17 June 2010, at 6.30pm

Membership Renewals

Thank you to the many members who have renewed their membership promptly. Many more members paid by direct debit this year than last. Only three members were unidentifiable by their direct debit payment reference – if you think this is you, please contact the office as soon as possible to rectify your membership status. Reminders will be mailed to un-financial members at the end of April. Your support is very much appreciated. Marian Haire, Hon. Treasurer

Bulletin Editor, Bruce Welch

Lecture 2 June 2010, Darlington Centre at 7pm

Dr Peter Tyler – Royal Society of NSW Historian

Science for Gentlemen – The Royal Society in the Nineteenth Century

In June 1821, towards the end of Lachlan Macquarie's term as Governor, seven men formed the grandly named Philosophical Society of Australasia "with a view to inquiring into the various branches of physical science of this vast continent and its adjacent regions." Although it only survived for a little over a year, this was a predecessor of the present Royal Society of New South Wales.

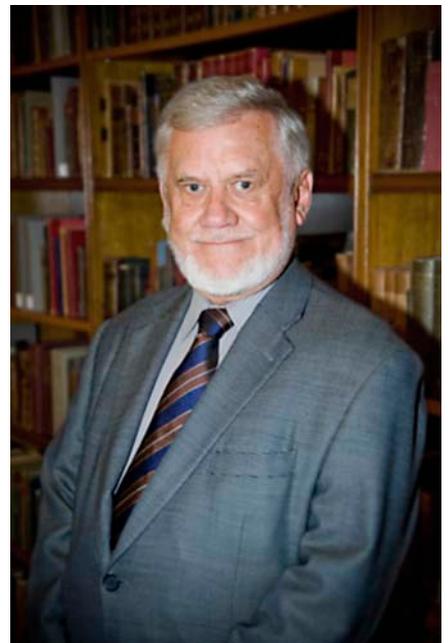
During the nineteenth century the Royal Society and its three antecedents functioned as an exclusive club for men "of honourable reputations" interested in the natural sciences. Almost without exception the members were pastoralists, merchants, or professionals such as clergymen, lawyers or medical practitioners. They classed themselves as gentlemen, because they were not engaged in physical labour. Only a handful were what we would now call scientists, because separate disciplines were only beginning to emerge, and career opportunities were few. This does not mean that science was merely a hobby for them, or a part-time diversion.

Members of the Royal Society were part of the colonial conservative establishment. Women were excluded, while rigorous admission procedures ensured that 'working men' did not become members.

Nevertheless, the Royal Society recognised the need to educate or inform the broader public about the achievements of science, and organised regular gatherings for that purpose.

In the twentieth century more inclusive attitudes emerged gradually, reflecting the changes in the wider community. Today it is difficult to discern any remnants of the earlier caste system. A question we might ponder is – has the influence and public profile of the Royal Society diminished at the same time?

Dr Peter J. Tyler is the Historian for the Royal Society of New South Wales. In 2008-9 he was the inaugural Merewether Research Scholar at the Mitchell Library. A graduate of the University of New England, Peter has held management positions in the public, private, and not-for-profit sectors. He has been President of the NSW Branch of the Australian and New Zealand Society of the History of Medicine, and of the Professional Historians Association (NSW).



Patrons of The Royal Society of NSW

Her Excellency Ms Quentin Bryce AC

Governor-General of the Commonwealth of Australia

Her Excellency Professor Marie Bashir AC CVO Governor of NSW

From the President

Science House is back on the agenda following a meeting held with the Acting CEO of the Sydney Harbour Foreshore Authority, Ms Egle Garrick on 29 April. The Executive Director of the Royal Botanic Gardens Trust, Dr Tim Entwisle, and the President of the Geographical Society of NSW, Professor Kevin Dunn, accompanied Robyn Stutchbury and I to the meeting. We were informed that part of the building had very recently been leased to an arts organisation but that two whole floors and the top floor apartment were still available for lease. It was felt that this might actually be a more attractive option for us at the moment as it might be more achievable financially.

A follow-up meeting was held at the Royal Botanic Gardens on 7 May to consider our collective position and it was decided to seek commitments from interested organisations who already had expressed interest in the project. We are currently awaiting responses



from these groups. It is important that we act with some speed on this as the opportunity may well be lost to the market place otherwise.

Many of you will remember the last paid librarian of the Society, Mrs Grace Proctor, who passed away over 10 years ago aged 89. Grace was a stalwart of the Society over several decades and gave of her time entirely voluntarily well into her eighties after she retired from her

position at the Society. I have at last been successful in finding a grower who will breed a new variety of rose that can be named in her honour. This is now in train and I hope to be able to supply more details shortly.

I took the opportunity of being in Coffs Harbour on work-related business recently to make contact with academics associated with the University of New England with the express purpose of working out ways in which we might be able to revive the New England Branch of the Society. Professors Gisela Kaplan and Lesley Rogers have a strong interest in seeing the Branch revived and have provided me with important contacts who may be able to reactivate what was once a thriving part of the Society. Having a Branch in Armidale is very important to the Society as the bulk of our library collection is housed in the Dixon Library at UNE, and it is to this institution that all our Journal exchanges go. I will let you know how this progresses.

John Hardie

Lecture delivered for the Society's 1180th Ordinary General Meeting held on 5 May 2010

The Weird World of Nanoscale Gold

Michael Cortie, Director : Institute for Nanoscale Technology, University of Technology Sydney

Not all gold is the inert, soft yellow metal that we all know and love to own. In fact, as Professor Cortie explained to a very interested audience at the May OGM, if you take a piece of bulk gold and divide it into smaller and smaller particles, gold's material properties change dramatically. Gold particles with a diameter of a few hundred nanometres are black (and very useful for absorbing solar radiation). Shrink them down to a few 10's of nanometres and they become a beautiful deep red (ideal for making stained glass). Decrease the size to 2 nanometres and the gold particles become brown and sticky with a melting point of only 300° C (compared to 1063° C for bulk gold). The chemical reactivity also changes radically with particle size. Bulk gold is extremely inert (which is why we use it for wedding rings and electrical contacts). However, 5 nanometre sized gold nanoparticles are extremely reactive. So reactive in fact, that they are the best-known catalyst for producing carbon monoxide.

The unique properties of gold nanoparticles make them a very useful

new material. By controlling the size, shape and surface coatings of the nanoparticles it is possible to tailor a wide range of chemical, optical and biological properties that have great technological potential.

One application that Professor Cortie's group are working on is optically selective coatings. By carefully controlling the particle size and shape it is possible to create a coating that transmits most of the visible part of sunlight but blocks solar heat. This can greatly reduce the cost of heating a building. The gold is used in such small amounts that it does not add much extra cost to the windows.

Another application is killing pathogens and cancer cells inside the body. We usually think of the human body as completely opaque. However, it is actually relatively transparent at a wavelength of about 700 nm. So if gold nanoparticles are introduced into the body that absorb at this wavelength, one can selectively kill tissues by focusing 700 nm laser light onto diseased areas deep inside the body. The light is absorbed by

the nanoparticles and turned into heat that quickly and completely destroys the targeted tissue. The precise focus of the laser minimizes harm to healthy tissues compared to the brute-force, blunderbuss approaches of radiation therapy or chemotherapy. Another advantage of gold nanoparticles is that they are non-toxic and not retained by the body. Indeed, gold nanoparticles have been a staple of Traditional Chinese Medicine for over two thousand years. Professor Cortie has also had considerable success in coating the gold nanoparticles with antibodies to enhance the fraction that reach the target zone. So far the results are limited to invitro tests. But it may not be long before gold nanoparticles are coming to a hospital near you.

Jim Franklin,
Councillor, Activities Coordinator



Meet your new Councillor Professor D Brynn Hibbert

Professor Hibbert occupies the Chair of Analytical Chemistry at the University of New South Wales in Sydney. He is the second incumbent and arrived in Australia from England in 1987.

His research interests are in electroanalytical chemistry and chemometrics and metrology in chemistry, but he also does a sideline in expert opinion, scientific fraud and presenting science to the public.



He has published around 220 papers, 5 books and 3 patents. His recent books are, *Data Analysis for Chemistry: An Introductory Guide for Students and Laboratory Scientists* (Oxford University Press, New York, 2005, 192 pp) written with Justin Gooding, and *Quality Assurance in the Analytical Chemistry Laboratory*, published by Oxford University Press in 2007. Professor Hibbert won the Ollé Prize of the RACI in 2008 for this text.

He is past Chair of the Analytical Division of the RACI, Secretary of the IUPAC Analytical Division and was co-chair of Interact 2002.

The RSNSW and Radio

When reading the ABC magazine *Limelight* I came across this piece in an article about the Albert family (music publishers and entrepreneurs):

"Ernest Fisk, managing director of Amalgamated Wireless Australasia Ltd ... gave the first demonstration of wireless transmission and reception of program material in 1919 with a broadcast of 'God Save the King' from AWA's Sydney office, received in the Royal Society of New South Wales's rooms on the other side of the city."

Peter Tyler

Ed: Marconi wireless telegraph had been around in Australia since the early part of the 1900s and used during WW1. Although by 1919 a large number of amateurs had been broadcasting voice for some time, it would appear that this event in 1919 involving the Royal Society of NSW was the first public demonstration of wireless radio transmission in Australia.

First meeting of the Central Western Branch of RSNSW

The first meeting of the Central Western Branch of the Royal Society of New South Wales was a great success. They had a room at the Orange Regional Gallery that held 60 but crowded in 70 and turned many people away.

Kevin Parton chaired the meeting, starting with some remarks about the Royal Society of NSW and the local branch. I spoke briefly about our history and invited people to join. I then presented membership certificates to the new members, followed by the evening's lecture.

The speaker was Prof Ray Norris on "Galaxy Evolution". It was an interesting lecture, pitched at just the right level and illustrated with great astronomical slides. The questions afterwards had to be truncated and were mostly intelligent and relevant. One was, "How does gravity work?" A question to which we would all like to know the answer. Light refreshments and wine were served in an adjacent room after the lecture at which animated discussion continued.

I put out on a table our Cook and Banks plaque, copies of two of our recent bulletins, the Liversidge book and its order form, our Royal Society of NSW leaflets (all of which went) and membership application forms, many of which were taken.

After the light refreshments the speaker was taken to dinner at a nearby restaurant with nine of us.

Kevin Parton will be doing a full report on the meeting and talk for the next Bulletin.

I think the time is right to continue efforts to revive our Armidale branch. I suspect that the response would be similar to that in Orange.

Jak Kelly

New Members

Two new members were announced at the May meeting of the Society:

Jill Trehwella - Full Member

Elizabeth Blackburn - Honorary Member

We welcome them into the Society.

Southern Highlands Branch

Report of April Meeting

Polar biotas of southern Australia of the Early Cretaceous age

Professor Patricia Vickers-Rich, Personal Chair, Palaeontology, Monash University, Melbourne and Dr Tom Rich, Senior Curator, Museum Victoria

The Southern Highlands Branch meeting of 20 May 2010 was held at 6.30pm in the Drama Theatre, Frensham School, Mittagong. An audience of 50 welcomed the husband and wife palaeontologists who arrived from Melbourne to deliver the lecture.

In May 2009, Thomas Rich delivered a fascinating lecture to the Southern Highlands Branch. It was entitled Mammals from the Age of the Dinosaurs: An Australian Perspective. During that address, he referred to the work that was being undertaken by his wife, Patricia Vickers-Rich. The pair have collaborated on numerous projects, and co-authored at least 10 books, three of which have won major science publishing awards. The committee subsequently decided to issue an invitation to both scientists to deliver the Southern Highlands Branch May 2010 lecture. The shared address was very well received by the audience, whose only complaint was that the lecture time of one hour was far too short!

Patricia Vickers-Rich's research centres on understanding the changes in the biota of Earth during the late Proterozoic, at a time when complex animals first appeared and the major animal phyla were differentiating. Her studies look for correlations between such biotic change, ocean chemistry, climate and plate tectonic effects on continental relationships and ocean basin geography. She commented during her lecture that, quite independently of the current world interest in climate change, she had in fact been conducting highly relevant studies into historical climate change as her teams investigated their correlation data.

Much of Patricia Vicker-Rich's research is being done overseas. Her field areas include south-west Africa (particularly Namibia in a joint program with the Namibian Geological Survey), the Eastern European Platform including the White Sea and Siberia (in conjunction with the Palaeontological Institute of the Russian Academy of Sciences), north-west Argentina, and the Flinders Range of South Australia (with the South Australian Museum). She also works with

Tom Rich (Museum Victoria) on the polar biotas of southern Australia of the Early Cretaceous age. Recently she has edited a Geological Society special publication, the book entitled *The Rise and Fall of the Ediacaran Biota*.

Thomas Rich's presentation concerned a time when Australia was joined to Antarctica, which was located close to where we find it today. Thus, south-eastern Australia was well within the Antarctic Circle of the day. Thomas Rich's research is conducted over an area of approximately four square kilometres of the Victorian coast, where he continues to locate and identify polar dinosaurs between 106 million and 120 million years old. The fact that these creatures had to survive in a frigid climate adds significantly to the evidence that some dinosaurs at least were warm blooded.

As more is learned about the Victorian polar dinosaurs, it is becoming clearer that, unlike the present fauna of Australia, the dinosaurs were not as uniquely Australian. That is, dinosaurs in Australia are members of a group of dinosaurs known from elsewhere. There is no equivalent of the uniquely Australian koala among them.

One particular dinosaur that will be forever remembered by members of the audience is Timimus, a small coelurosaurian theropod known only from two fossilized upper leg bones. Tom and Patricia named this particular discovery after their son Tim, and also in honour of Tim Flannery. The pair have recently collaborated with David Attenborough for a documentary sure to intrigue a world audience.

Anne Wood

One Hundred Years Ago . . .

Extract from the Presidential Address by H. D. Walsh, delivered to the Royal Society of N S W, May 4, 1910

The application of reinforced concrete to wharf and jetty construction has not anywhere kept pace with the advancement of the same compositions on dry land. The greater number of wharves so built are more or less imitative of timber work. In this part of the world reinforced concrete wharves have been built at Auckland, Tonga, Wellington, Gladstone, Brisbane, and Adelaide, and they are all practically of similar design - pile and deck structures. Nothing of the kind has been essayed, so far, either at Sydney or Melbourne, though, at the latter port, this class of construction was recommended by the engineer engaged to report upon the Port of Melbourne in 1908.

It might be inferred from these facts that we, in Sydney, are getting behind the time; but such is far from being the case. Reinforced concrete has been applied in connection with our wharfage works, but following an entirely new line of development, we have not up to this constructed any reinforced deep water berths, but considerable progress has been made in the direction of reinforced concrete sea-walling.

It may have been remarked that timber wharf and jetty construction still holds its own in Sydney Harbour, though to a large extent abandoned in Europe. Local conditions must, however, always determine the class of construction best suited to the services needed. In some parts of the world a high range of tide renders timber work less suitable than iron or steel, on account of the great length of piles required. Possessing as we do a port with a spring tidal range of only 5 1/2 feet, and undoubtedly the best timber in the world for wharf construction, it is natural that we should make use of that timber as long as the supply lasts and can be obtained at a reasonable cost.

With the present heavy demand for first-class timber for use on our national works as well as for exportation, our forests are rapidly being thinned out, and it is inevitable that unless some drastic measures are shortly taken in connection with reforestation and exportation, the time will come when sufficient first-class timber with which to carry on our works will be unattainable except at prohibitive cost. During the past year we have used in connection with Sydney harbour works alone 3,450 piles, 3,009 girders, and 1,186,000 super feet of decking and timber for shed-work. This has denuded at least 4,000 acres of our best forest country; when we consider the quantity of timber used in other harbour works, bridge building, and for various other purposes, we can realise how much of our ironbark, turpentine, and other first class timbers is being cut out annually. Up to the present time no steps have been taken to replenish the supply.

Editor

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