



The Royal Society of New South Wales Bulletin and Proceedings 310

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November 2007

Future Events 2007

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.

Southern Highlands Branch Lecture

Thursday 15th November, 6.15pm

Nanotechnology or terribly tiny things *What does the future hold for these tiny structures in health, science and electronics?*

Professor Jak Kelly

Drama Theatre, Frensham, Waverley Parade, Mittagong

Wednesday 5th December

Note early start for lecture: 6.30pm

The Clarke Memorial Lecture

The Architect and the Statesman:

Archibald Liversidge, Edgeworth David, and the Spirit of Science in Sydney, 1874-1934

Dr David Branagan and Professor Roy MacLeod

Followed by our —

Christmas Celebration

Wednesday 5th December at 8.00 pm following the Clarke Lecture

Share seasonal cheer with members and friends of the Royal Society of NSW in the Cloisters of St Paul's College Quad. The City Road entrance to St Paul's is directly opposite the Darlington Centre. Go through the entrance flanked by two sandstone pillars and proceed north along the driveway for 200 metres (keeping the oval on your right) until you come to a 4 m high archway. Walk through the arch and across the quad to the Cloisters. Park beside the oval.

Cost \$20 per person

Booking essential, book now!

For more details see page 2.

The Clarke Memorial Lecture - 5 December 2007

Professor Roy MacLeod and Dr David Branagan

The Architect and the Statesman: Archibald Liversidge, Edgeworth David, and the Spirit of Science in Sydney, 1874-1934

Archibald Liversidge, FRS, and TW Edgeworth David, FRS, are among the most distinguished scientists of late 19th century Sydney. Arriving at the University in 1872 and 1891, respectively, they led the second generation of British men of science who gave shape to colonial science under the Southern Cross. In many ways, their interests were complementary. Both educated in England, both strong Empire men, both saw the pursuit of natural knowledge as a practical vocation -- and science, as a way of making sense of nature's contrarities, while bringing economic benefit to the people. Yet, here the similarity ends. Liversidge, a younger son of an artisan wheelwright, was born to



Professor Roy MacLeod



Dr David Branagan

the East End of London, and was a product of the expanding world of commercial and technical schools and applied chemistry. David, a Welsh-born son of the manse, was a product of Oxford, and heir to a tradition of gentlemanly geology. Englishman and Welshman, working class and middle class -- a short, chubby man with glasses and a stammer versus a man of aristocratic height and mien -- their many small differences never seem to have challenged their personal friendship. As academic allies, they were inseparable. Even so, such small differences as did divide them, surfaced in what became very different approaches to the business of colonial science, university politics, and social life.

This lecture -- a two-part presentation by their latest biographers -- will explore these similarities and differences, and will suggest how their 'combination of talents' helped shape the development of Sydney University and the Royal Society of NSW, as well as the image of science in Australia generally. Both men were cast, unavoidably, in the role of public scientist -- as advocates and administrators, prophets and proselytisers. One remains best known as an architect and builder; the other, as a statesman of science -- the former a careful analyst and tireless believer in intercolonial cooperation; the latter, an adventurer, explorer, and Commonwealth spokesman. Together, their work helped define what was uniquely 'Australian' in an otherwise distinctly British world of imperial science. As we see in the unfolding histories of Sydney University and the Royal Society of NSW, their legacies were to prove both lasting and incomplete. Together, they helped cultivators of science to come together and flourish; yet, both were destined to leave for later generations the larger task of creating a scientific spirit among the people of Australia.

Patrons

**His Excellency, Major General Michael Jeffery AC CVO MC (ret'd),
Governor General of the Commonwealth of Australia**

Her Excellency, Professor Marie Bashir AC CVO Governor of NSW

Farewell Irene Kelly

RSNSW Office Manager

Irene was born in Vienna but went to school at North Sydney Girls High. She enrolled in the Faculty of Dentistry at Sydney University when she was 16. She and



Dentistry parted to the mutual satisfaction of both. She then worked in the CSIRO Division of Physics at the National Standards Laboratory where she met Jak Kelly. They married and in those days, married women were not allowed to work in Government jobs – regarded as taking a man's job – unless you were vitally important. She was therefore forced to resign. Quite an unbelievable regulation in this day and age.

She heard that the newly arrived Harry Messel in the School of Physics at The University of Sydney was looking for scanners and walked down the road from the NSL to the Physics School and became one of the first scanners. They spent their time on microscopes looking for significant tracks of mesons and other particles, generated by cosmic rays hitting nuclear photographic emulsions flown by balloons to the upper atmosphere.

Irene and Jak then left for Reading University and AERE Harwell, England, where Jak did his PhD and research work. Two of their three children, Michael and Karina were born there and their third child, Julian was born in Australia after their return, five years later.

With the children grown up, Irene completed a degree in Fine Arts at Sydney University, where Karina was a fellow Arts student, while the male members of the family were at UNSW.

There followed a period of what friends called "jobettes", proof reading, free-lance editor jobs and even something that sounded quite exalted, 'academic advisor'.

After three years as Office Manager of the RSNSW, she has now decided to take a back-seat and only help when help is needed. Val Gregory will be the new office manager as of next year.

Matthew Colless' lecture 5th November 2007

Dark Energy, New Earths, Gravity Waves and Giant Telescopes: The Future of Australian Astronomy

It is one of the great scandals of our time that we have no idea what most of the universe is made of. Professor Matthew Colless gave an entertaining and very wide-ranging overview of what astronomers know about the composition of the cosmos, how they know it, and what new instruments will tell us. Work in the last decade has shown that less than 5% of the universe is ordinary matter (planets, stars, gas clouds, neutrinos, etc). 17% is dark matter, detected gravitationally but of unknown nature (probably some kind of exotic sub-atomic particles). And fully 77% of the universe is "dark energy" which has completely unknown form.

The key parameter for the universe is its energy density. This number determines the geometry of space-time and whether the universe will eventually collapse (high energy density), or whether it will expand forever (low energy density). Professor Colless explained in a very lucid fashion how this parameter has been measured using: "standard candles" given by supernova, the "standard ruler" of baryonic acoustic oscillations in the cosmic microwave background radiation, the "standard scale" from gravitational lensing of distant galaxies and the growth rate of cluster density perturbations. Remarkably, all these independent lines of enquiry have shown that universe's energy density is very close to the critical value for a flat expanding universe.

Professor Colless then surveyed progress in discovering planets around other stars. Over 250 exoplanets are now known. The Anglo-Australian Telescope has some of the world's best instrumentation and has discovered 25 exoplanets (10% of the total). Improved equipment means that the rate of discovery is increasing – last year the AAT discovered 6 more exoplanets in only 32 nights of observing. Almost all known exoplanets are "hot Jupiter" gas giants. AAT is now leading the hunt for rocky planets, similar in size to the Earth.

Current astronomy is essentially limited to observations of electromagnetic radiation. Prof Colless described work being done at the Parkes radio telescope to observe gravitational radiation by measuring timing anomalies in pulsars. This could open an entire new window on the universe.

Great discoveries require great telescopes. Prof Colless described the new instruments that he hopes will form the backbone of future Australian astronomy. The Square Kilometre Array will be the world's largest radio telescope. Site selection for this \$2.5 billion international project has been narrowed to a choice between Western Australia or Southern Africa. Australia is also participating in the Giant Magellan Telescope, a 21.5 m effective aperture optical instrument to be built by an international consortium in Chile. (Australia has great astronomers but no great optical sites.) However, Australia does have the Australian Antarctic Territory which is probably the best observing site on the planet. Prof Colless described the PILOT project, a 2.4 m telescope at Dome C in Antarctic that would have a similar performance to the Hubble Space Telescope at a tiny fraction of its cost.

The future for Australian astronomy is bright.

Jim Franklin

Professor Matthew Colless is the Director of the Anglo-Australian Observatory. He was the co-leader for the 2dF Galaxy Redshift Survey of 221,000 galaxies that has greatly contributed to our understanding of the large-scale structure of the universe.

Christmas Party 2007 - Book Now!

Don't miss out. This year's Christmas cheer for members and friends will be better than ever. **Wednesday 5th December at St Pauls College, 8.00 pm**, immediately following the Clarke Memorial Lecture. Cost to offset catering, \$20 per person. **Please book with payment no later than Wednesday 28th November** through Irene or Val at the Royal Society office, by email (royalsoc@usyd.edu.au) or by post (address p4) with cheque or bank draft. For further information, phone the office on 02 9036 5282 or enquire by email.

Parking within St Pauls alongside oval

Southern Highlands Branch Lecture

Thursday 15th November, 6.15pm

Drama Theatre, Frensham, Waverley Parade, Mittagong

Professor Jak Kelly: Nanotechnology or Terribly Tiny Things

Nanotechnology is one of the most active and universal areas of research in physics. Almost every Australian University has a group in this area but is it new? Why this sudden burst of activity and what are the implications for health, electronics and the fashion industry?

One of the most amazing recent developments is the discovery of graphene, sheets of carbon only one atom thick, previously thought to be theoretically impossible. You will learn about its amazing properties and how to make graphene at home using only household items.

Prof Jak Kelly was Chairman of the Faculty of Science and Head of Physics at UNSW. After official retirement he became Visiting Professor of Physics at UNSW and Honorary Professor of Physics at the University of Sydney. He is the immediate past president of the Royal Society of NSW.

For dinner bookings only, call the Fitzroy Inn on 4872 3457. For all other enquiries please call 0414 621 650

Garvan Institute

The Garvan Institute of Medical Research houses over 400 scientists, students and support staff, making it the largest medical research institute in New South Wales. The Institute has grown enormously since its creation over forty years ago as a research department of St Vincent's Hospital Sydney. The current world-class facility was completed in 1997. The Institute maintains strong links with St Vincent's Hospital, and is affiliated with the University of New South Wales, where its postgraduate and honours students are enrolled.

Garvan's mission is to make significant contributions to medical science that will have major impacts on human health. The Garvan Institute receives funding from a range of prestigious and highly competitive Australian and overseas sources such as the Australian National Health and Medical Research Council, Cancer Institute NSW, and the Juvenile Diabetes Research Foundation International.



The Garvan's spiral staircase symbolizes the shape of DNA, and reflects the importance of genetics to the Institute's research

Garvan scientists apply the latest technology to their innovative research, which is aimed at the development of better methods of diagnosis, treatment, and ultimately, prevention of diseases that are a major problem in today's society. These diseases include inflammatory disorders, cancer, diabetes, Alzheimer's and osteoporosis. The inflammatory conditions include rheumatoid arthritis, systemic lupus erythematosus and asthma. Cancer research is particularly focussed on cancers of the breast, ovary, pancreas and prostate. Research on diabetes includes work on both Type 1 and Type 2 diabetes. The research is underpinned by excellent common resources, particularly in the areas of gene microarrays and sequence analysis, flow cytometry, molecular imaging and bioinformatics.

Associate Professor Bill Sewell, Royal Society Councillor

From the President

November 2007

Congratulations are in order for our consultant Dr Peter Tyler and member of Council Robyn Stutchbury for their successful completion of our second project under the Community Heritage Grants Scheme administered by the National Library of Australia. As I write this on a brief visit to Cape Town, I keep thinking of the impetus this report now gives us to leverage off the achievements of the past to enhance our Society, to make it stronger and richer, and to enable us to better achieve our Society's 'objects' of bridging the 'knowledge gap', both across the sciences and outside them.

A clear message from the report is the need to spend time and energy 'rescuing' our treasures from their cardboard boxes and finding ways to properly house them so that they might be available from time to time for display or general exhibition. We will need your support in this endeavour.

As this is the last Bulletin for the year I would like to take this opportunity to thank you for your continuing support of the Society and to stress that the Society is nothing without its members. Therefore I ask you to approach your colleagues and friends to join our Society to enable it to continue to grow and increase its activities into the future. You may have noticed that our Membership Form is now available on our website at www.nsw.royalsoc.org.au so I encourage you to direct your contacts to it.

I'd like to wish you all a happy and safe festive season and together we can look forward to a very active 2008.

John Hardie

PS Don't forget our Christmas Party on 5th December! I look forward to seeing you there.

Members

You are invited to contribute articles and notices to the Bulletin. Do you have comments to make? Are there events coming up that we should all know about? Please send in your contributions by the end of the first week of the month to the Society's office (contact details p4).

Meet Royal Society member

Fred Blanks AM

In a professional sense, Fred has led a double life. A Royal Society Member since 1947, he graduated from the University of Sydney as a scientist specialising in organic



chemistry, working in research and later in managerial roles, retiring in 1948.

But, simultaneously he practised his hobby, which then became another profession, as a music critic.

As a scientist he worked in Australia and the U.K. for ICI; as a musicologist, he was contributing music critic to the Sydney Morning Herald from 1963 to 1998;

Australian Correspondent for Musical Times (U.K.) from 1955 to 1991, and writer and lecturer for numerous organisations (including the Royal Society).

In the Queen's Birthday Honours 1988, he was awarded the Order of Australia (AM) 'for services to music'.

Fred was born in Germany, fled from the Nazis in 1938, went to school in Bournemouth (U.K.), where he learned English and the rules of cricket (the latter being the more demanding),

Community Heritage Project November 2007

We met the deadline! The final report for the Community Heritage grant has been submitted to the National Library of Australia. Peter Tyler rated some 620 items from the 48 boxes of Royal Society archives held in the Mitchell Library. The ratings were for the condition of the items (A, good; B, fair, and C, in need of conservation) and for their cultural and historical significance (A, highly significant; B, of some historic value; C, duplicate or non-essential items requiring culling, and D, recommended for disposal). The analysis of these ratings is contained in Peter Tyler's report which is to be tabled at the next meeting of Council (28 November 2007). Briefly, of the 620 items there were 352 (57%) classified as highly significant and 373 items (60%) in need of care, some of great urgency. What are we to do? There was no thought of applying for a further grant. This could have been up to \$15,000 for a preservation survey requiring a professional conservator. Before we can attempt such a move there is the requirement to have the collection accessible to the public under archival conditions. This in turn requires very much more space than we now have. It would require premises similar to Science House, if not Science House itself. It is so disappointing to be able to see just what needs to be done and yet be so powerless act on it. Perhaps next year, in order to determine how to deal with the problems of the magnificent Royal Society collection, we should survey members for their opinion, ideas and assistance.

My thanks goes to Dr Peter Tyler for his diligence and tenacity. He very generously devoted much of his own time to the CHG project; well over the contractual amount from the grant.

Robyn Stutchbury, CHG Project Manager

And to finish with a little mirth...

These howlers have been posted on the Australian Science Communicators' List by Dr Will Rifkin, Director of the UNSW Science Communication Program.

Question: What is one horsepower? Answer: One horsepower is the amount of energy it takes to drag a horse 500 feet in one second.

Talc is found on rocks and on babies.

The law of gravity says it's not fair jumping up without coming back down.

Rainbows are just to look at, not to really understand.

Someday we may discover how to make magnets that can point in any direction.

South America has cold summers and hot winters, but somehow they still manage.

Receiving your copies of the Bulletin

For those who have not yet done so, please send your name and contact phone number or email address together with your preference for receiving the Bulletin either by email or post.

A special thanks to those who have taken the time to comment on the new format. It is really helpful to receive feedback.

Robyn Stutchbury

Contact your office bearers

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