The Royal Society of New South Wales
Bulletin and Proceedings 341

ABN 76 470 896 415 ISSN 1039-1843 November 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.

Friday 26 November 2010, at 5.30pm

Liversidge Lecture

Professor John White, ANU

Belief in Science

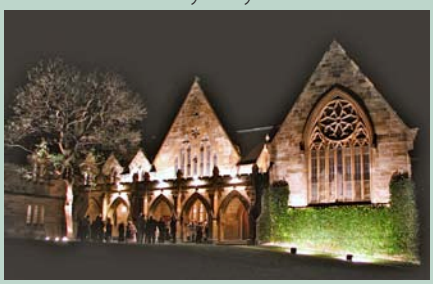
Merewether Theatre, University of Sydney

Wednesday 1 December 2010
6.30pm (NB early starting time and special venue)

Studentship Awards and talks followed by

Christmas Party 2010

Venue: St Paul's College, University of Sydney



(see details at right and page 8)
(see booking form included with this Bulletin)

Our first event for 2011 will be the Four Societies Lecture in February. Details in the next Bulletin.

Royal Society of NSW Scholarship Awards 2010
6.30pm, 1 December 2010
Rodgers Room, St Paul's College, University of Sydney

Our last meeting of 2010 provides the opportunity for members to hear research presentations from the winners of the Society's scholarships. The winners were selected from a range of high quality submissions from research students in several different Universities in NSW and the ACT. Come and hear about work being done by top research students! Outlines of three winning submissions are presented below. In addition, the winner of the Australian Institute of Physics (AIP) Royal Society Scholarship will give a presentation. This winner will be decided at the AIP event on Tuesday 23 November 2010.

Lidia Matesic is a PhD student in the School of Chemistry in the University of Wollongong. Her project is on "Targeted Delivery of Chemotherapeutic Agents Using Novel Isatin-based Compounds."

Targeted drug delivery increases the availability of a drug at the target site while reducing its availability at other sites. A novel strategy which shows promise for the targeted delivery of cytotoxins into tumour cells exploits the urokinase plasminogen activation (uPA) system. Once the uPA system has been used to deliver the cytotoxin into the cell, the cytotoxin must be released in an acidic intracellular environment. Lidia is working on isatin, a natural substance isolated from the *Isatis* genus of plants, which has anti-cancer activity. The chemical structure of isatin has been modified to improve potency against human cancer cell lines. Lidia is investigating the properties of a range of imine-based acid-labile linkers, to join isatin to the PAI2 component of the uPA system. These linkers are designed to allow effective release of isatin within the target cell.

Dennis Black is a PhD student in the Faculty of Engineering at the University of Wollongong. His thesis is entitled "Factors affecting the drainage of gas from coal and methods to improve drainage effectiveness".

The objectives of Dennis's research are to investigate and isolate specific geological properties and operationally controlled factors that impact on coal seam gas production. The research will lead to recommendations to improve the efficiency and effectiveness of gas drainage, particularly in known difficult drainage zones. The success of this project will have significant impact on the health and safety of mine personnel, economics and environmental performance of underground coal mining in Australia and beyond, through increasing the effectiveness of coal seam gas extraction. This will contribute to improving the utilization of coal resources. Increased gas extraction from *in situ* coal seams also serve to reduce the gas content ahead of mining. This will inevitably reduce the risk to mine and personnel safety, as well as reducing the mine's fugitive emissions.

Kerensa McElroy is a PhD student in the School of Biotechnology and Biomolecular Sciences at the University of New South Wales. Her project is "Evolutionary dynamics of the human pathogens *P. aeruginosa* and Hepatitis C Virus".

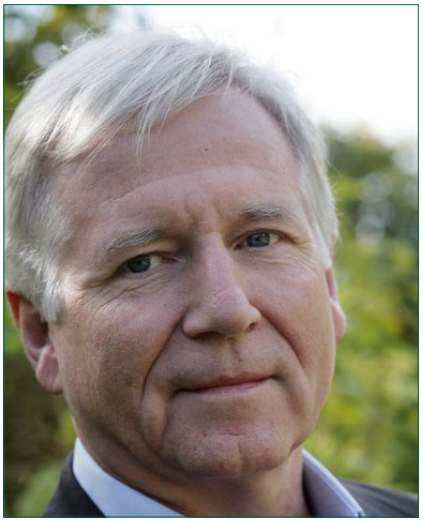
Kerensa's research focuses on using mathematical and bioinformatics tools to

Lecture delivered for the Society's 1186th Ordinary General Meeting held on 3 November 2010

Powering the US Grid from Solar and Wind

Dr David Mills, Chief Scientific Officer and founder of Ausra, Inc.

This month's lecture was in sharp contrast to the October lecture that explored the practicalities of supplying large amounts of base-load power demand using nuclear energy. Nuclear power generation is an established technology but highly controversial due to its perceived risks and potentially its high cost. Solar and wind energy generation are emerging technologies with great promise but currently are expensive and are yet to be used to meet so-called base-load demand.



Dr David Mills has a background in developing novel solar energy technologies, including two-and-a half years in Silicon Valley in the US establishing a company commercialising "concentrating solar thermal" technology. (This technology uses mirrors or lenses to concentrate the sun's rays in order to heat a heat transfer medium or to generate steam which in turn can be used to generate electricity.) In this lecture, Dr Mills described work recently completed to determine whether the 2006 energy demand on the US electricity grid could, theoretically, have been provided through commercially available solar and wind technologies.

There are enormous amounts of both solar and wind energy available (the potential of global wind energy is 72 TW whereas human demand is about 15 TW; solar power is even more abundant – 120,000 TW is available – about 8,000 times human demand). The challenge is developing and commercialising technologies that are cost-effective in comparison with the well-established coal, gas, and petroleum sources. The obvious advantages of both solar and wind energy are that they produce no greenhouse gas emissions or pollution. Wind energy generation has grown substantially in recent years but with about 160 GW installed, this meets only about 2% of global demand. Solar thermal generation has been under development for the last 30 years but is expensive and is only recently becoming competitive. Spain and the US are the leaders in this technology and 14,000 MW are expected to be installed in the next five years with capital costs of around $400 million per project.

With appropriate design, solar and wind technologies can be complementary: solar generation is not directly available at night, whereas wind is often at its maximum at night; storage of wind-generated energy is difficult (although there are some interesting battery technologies under development), whereas solar can store energy in heat-sinks such as molten salts and this can be used to generate energy at night or when there is heavy cloud.

The study by Dr Mills and his colleagues produced some unexpected results. Their detailed analysis of US demand (done by evaluating hourly demand data taken from the US grid over the 2006 year) concluded that currently commercially available wind and solar technologies could have produced 90% of the US electricity grid load with 25% redundancy (redundancy is the ability to bring additional generation resources online to replace generation equipment which is not functioning) and no energy storage. Further, they found that these technologies could have produced 100% of electricity demand at 35% redundancy, with 12 hours storage.

One of the key challenges is to think about the electricity system differently. The current paradigm of thinking about base-load demand with peaks that sit on top of this has come about because of the inflexible technologies currently used to generate electricity. For example, it is difficult and expensive to start and shut down coal-fired power stations in response to demand changes, so the concept of having some base-load that is met by power stations running 24 hours a day, seven days a week makes sense. But when a variety of technologies that are much more flexible are available (for example concentrating solar thermal (with storage); battery technologies; hydroelectric; and photovoltaic (with storage) enable us to establish a new way of looking at electricity demand in terms of its load capability rather than its capacity to meet base-load plus peaks.

The October and November lectures provided interesting contrasts with one another. It is clear that there are a number of entirely feasible options for countries like Australia to reduce greenhouse gas emissions. The problem is not so much a technological one, rather it is finding the political resolve to come to terms with the social concerns and economic issues and invest in a sustainable future.

Donald Hector

Royal Society of NSW Scholarship Awards 2010

Continued from previous page

understand the evolution of human pathogens. She has developed mathematical models to explain the structure of pathogen populations by analyzing the vast quantities of DNA sequences obtained by pyrosequencing technology. Her bioinformatic research is complemented by wet-lab approaches. She is studying two important human pathogens, the bacterium *Pseudomonas aeruginosa* and the Hepatitis C Virus (HCV). She has shown that four out of 10 HCV patients are likely to have been initially infected with only a few (1-3) as opposed to many (>3) founding viruses. She has discovered that a pathogenic *P. aeruginosa* strain has an elevated death rate compared to a harmless, environmental strain. She aims to develop techniques in her PhD that are applicable to as broad a range of pathogens as possible.

William Sewell

From the President

I represented the Society at the 7th annual Convention of the Royal Societies of Australia (RSA) in Brisbane on 6 November. This was an opportunity to provide some redirection to the organisation and develop a realistic strategic plan which can be implemented over the next couple of years. Governance issues for the organisation were sorted out and a revised Constitution will be developed shortly. The RSA provides an opportunity for the Royal Societies in Australia to work collectively on major issues and to have one voice if necessary when liaising with governments, industry and other bodies. At the meeting I was elected President of the RSA.

Last Sunday I was fortunate in being invited by our Patron, Professor Marie Bashir, Governor of NSW, to attend a garden party at Government House, Sydney to celebrate the achievements of 2010, the year of Lachlan Macquarie, 5th Governor of NSW. The 37th Governor paid tribute to the achievements of her far-sighted predecessor and arranged for a re-enactment of a parade of Macquarie's 73rd Regiment of Foot dressed in period costume. Her Excellency took the salute after receiving the King's Colours and the Regimental Colours, both created as authentic replicas of the originals. It was Macquarie's successor, Governor Brisbane, who was instrumental in forming our precursor, the Philosophical Society of Australasia, in 1821. However, it was Macquarie himself who had created a climate in the colony suitable for its creation.

We were saddened recently to hear of the death of a long-serving stalwart of the Society, Miss Patricia Callaghan, who filled the office of Hon. Librarian admirably for many years. I was able to represent the Society at her funeral at North Sydney on 8 November, alongside two of her colleagues on Council, Dr David Branagan and Dr Alan Day. We will miss Pat's devotion to the interests of the Society and her impish smile.

Finally I would like to wish everyone all the very best for the holiday season and for the year to come. Next year promises to be as interesting and exciting as 2010 with an array of interesting speakers and some special events brewing. I welcome your feedback on what we do and look forward to receiving it.

John Hardie

Australian scientist honoured with top awards

An Australian-born chemist and microbiologist has received two of the world's most prestigious scientific awards.

Professor Jillian Banfield, who was born in Armidale, has received the Benjamin Franklin Medal in Earth and Environmental Science and is one of five women receiving the L'Oreal-UNESCO award recognising exceptional women in science.

The awards acknowledge her groundbreaking research into how microbes alter rocks and interact with the natural world.

Professor Banfield, who is based at the University of California, Berkeley has used the awards to plead with the Australian Government to give its scientists more support.

"I think that the universities have suffered tremendously from underfunding and defunding in Australia," she said.

Professor Banfield receives $US100,000 in recognition of her contributions to science. [from ABC news Wednesday 10 November 2010]

Professor Jillian Banfield is the daughter of Dr James E. Banfield, a botanist who joined the Royal Society of New South Wales in 1963 and passed away in 2002.

Winning scientist calls for better national funding

[Accessed from http://www.abc.net.au/pm/content/2010/s3062822.htm]

MARK COLVIN: An Australian born scientist who's just won two prestigious awards for her research says she would never have been able to do her work in Australia.

Jillian Banfield is a professor of earth and planetary sciences at the University of California Berkeley.

Today she was simultaneously awarded the Franklin Medal for trailblazers in science, and the L'Oreal UNESCO award for women in science.

Professor Banfield told Meredith Griffiths that she'd tried to understand the way micro-organisms near the Earth's surface help change soil and minerals.

JILLIAN BANFIELD: I very much think about what I do as basic research but of course it does have applications. Something like bio-remediation where we can change the conditions in a contaminated environment and stimulate the activity of micro-organisms who can then induce the transformation of contaminants.

MEREDITH GRIFFITHS: You've mentioned you work at Berkeley now and previously you've worked in Wisconsin and at Johns Hopkins but you are an Armidale girl originally I understand; do you think that you would be able to do the kind of work that you do in Australia?

JILLIAN BANFIELD: Well yes indeed I was born in Armidale and I went to the Australian National University and had a wonderful and free education thank you to the Australian Government at that time. I left to do my PhD just because that was the best place in the world I could do the research I wanted to do with the best person in the world but I

fully intended to come back to Australia but the reason I have not come back is that I could not possibly do the research that I do here in Australia and I think that's really unfortunate and I'm certainly not alone in finding myself in that situation.

MEREDITH GRIFFITHS: And why is that? Is it because you need to search from grants and there are more overseas or is it because the universities are better funded?

JILLIAN BANFIELD: It's really a large number of things but I think the investment here in basic science is terrific and there's an enormous value placed on really promoting and supporting young scientists to establish their careers and that really contrasts a lot with what I've seen happen in Australian universities, though I am a little optimistic that the culture is changing now but that's certainly been a problem in the past.

So really finding the funding, yes absolutely to buy equipment, to pay students, to pay post-doctoral students, which means people who've just recently received their PhDs and are going on for further training before they become fully independent scientists.

So to create a really active research environment to do science that needs to be developed this time it seems we need groups of people who work really closely together and so you need funding to be able to support a large interacting group like that and that funding just doesn't seem to be easy to establish in Australia with the ARC system as its currently configured.

MEREDITH GRIFFITHS: How could the Australian Research Council be changed to try to nurture that kind of culture you're talking about?

JILLIAN BANFIELD: Most probably the biggest problem is just not enough investment. You know science drives innovation, it creates economic growth and if you want that you need to invest; if you want active and successful research programs and Australia does have many of them but if you want more of them then you need to invest more. So I think the first thing is to put more money into the system obviously and the second thing is to really really make sure you keep the young people who are really bright and talented in Australia, in Australia to build their careers and make sure that they have what they need, room to move and resources.

MEREDITH GRIFFITHS: Do you think that it's up to the government to improve that funding or do you think that there's a role the private sector can play there as well, or philanthropic, any sort of non-government contributions?

JILLIAN BANFIELD: Well it's certainly true that the private sector does invest in research though my sense is that that investment has diminished greatly over the years. But I do think that the onus is on the government to invest in education; it's the most important thing that you can do for a country and so I would really hope that that culture would be reinforced in Australia, I think in the past there's been a lot of reliance on funding research that's of interest and directly beneficial to companies, but I'm not sure that that's the right balance; I think we need more just plain government investment in basic research.

MEREDITH GRIFFITHS: You mentioned that you headed off to do your PhD at Johns Hopkins because that was the best place and with the best person to do the research. What sort of systems need to be put in place to help young scientists at that stage?

JILLIAN BANFIELD: I think it's incredibly healthy for young scientists who've just finished their undergraduate degrees to go overseas and experience the world and get a different education with different people and it's absolutely the best practice to go to the place where the best person is and that could be anywhere in the world. But what is really important is that you bring them back to Australia and you give them the opportunities to do good work and have a career and be successful.

MEREDITH GRIFFITHS: How would you like to see that though?

JILLIAN BANFIELD: Jobs for people with PhDs in research universities in universities that invest significantly and provide the opportunities .

Genetech pioneer awarded science prize

John Shine – winner of the 2010 Prime Minister's Prize for Science

One of Australia's biotechnology pioneers, whose work has been instrumental in cloning insulin and growth hormone, has taken out this year's Prime Minister's Prize for Science.

At a ceremony in Canberra, Dr John Shine, director of the Garvan Institute in Sydney, received the award for his research in gene technology, including the discovery of key gene sequences that enabled cloned medicines.

Human insulin and many other cloned drugs that we take for granted today are made with the help of a brief gene sequence that tells bacteria when to start making protein.

Dr Shine discovered the now well-known GGAGG sequence, named the Shine-Dalgarno sequence, while working on his PhD at the Australian National University in the 1970s under the supervision of Lynn Dalgarno.

He says they had no idea how important the discovery would become.

"None whatsoever. Obviously in the context of my PhD studies it was very important ... so I was pretty excited about it," he said.

"[But] I had absolutely no concept of the practical implications that the sequence would turn out having in the development of biotechnology and the production of human pharmaceuticals from cloned genes."

[from http://www.abc.net.au/news/stories/2010/11/17/3069180.htm]

Vale

Joyce Marie Cole (née Cooper) 1916-2010

Joyce Cole, one of the longest standing members of the Society, died in March this year aged 94. She was brought up in Sydney, educated at North Sydney Girls High School and graduated from the University of Sydney with a Science Honours degree in 1936. She worked in the Department of Pharmacy at Sydney University, where she met Ted Cole, who became her husband. Ted completed a Masters and a PhD, and went on to be an Associate Professor in the School of Chemistry at the University of NSW. Joyce's career in science was interrupted by marriage and children. Subsequently she took up secondary school science teaching, for many years at Abbotsleigh and then at SCEGGS Redlands where she was Senior Science Mistress in the 1970s. Joyce was also a very longstanding member of the Australian Federation of University Women and the Australian College of Educators. She is survived by her son Ted Jr and by grandchildren Edward and Stephanie. Her daughter Alison predeceased her.

Joyce was interested in young people and was very skilled at engaging their interest. She was a highly capable teacher, and was well regarded for innovatory application of audiovisual technology as an integral teaching aid. She maintained enthusiasm and curiosity about science throughout her long life. She joined the Royal Society of NSW in 1940, before the proliferation of specialized scientific societies. At the time she became a member of the Society, she considered it a good organization for young scientists to join early in their career. In more recent years, although she was not able to participate in the Society's activities, she was keen to maintain her membership, to support the Society's role in fostering science.

Ted Cole Jr & William Sewell

Dr Robert Robertson-Cuninghame

The Society would like to record the death of a long-standing member, Dr Robert Robertson-Cuninghame, who passed away on 9 September aged 86.

Robert Clarence Robertson-Cuninghame was a First Class Honours graduate of the University of Sydney, a Rhodes Scholar, an Oxford DPhil, Chancellor of the University of New England from 1981-93, and a great supporter of the New England Branch of the Society. He had been a member of the Society since 1982.

His ancestors had selected land in the New England district in 1838. His mother Nancy was a granddaughter of Frederick White, who built Booloominbah, a rural homestead outside Armidale at that time. He was therefore a cousin of the Australian Nobel laureate Patrick White.

In 1936 a family member bought and gave the property to the University of Sydney on the condition the university establish a college at Armidale, to be called the New England University College. The college was established in 1938, with Booloominbah remaining as the foundation building. In 1954 the college gained autonomy, later becoming the University of New England.

In 1949, following war service and the completion of his undergraduate studies, Robertson-Cuninghame won a Rhodes Scholarship to Oxford, where he was a member of Trinity College. He was invited to join the Department of Agricultural Science at the University of Sydney but had to choose between becoming an academic and returning to the land. He chose the latter.

Some years later he was invited to join the Council of the University of New England, where he served as Deputy Chancellor from 1971 to 1981, when he became the university's fourth Chancellor. In 1988 he became an Officer of the Order of Australia for services to learning and in 2001 he was awarded the Centenary Medal by the federal government for services to education.

He is survived by his wife, Patricia (née Cotton), only daughter of C. M. Cotton, who was the brother of Professor L. A. Cotton, Professor of Geology at Sydney University from 1925-48, and of Professor F. S. Cotton, Professor of Physiology at the same university, three daughters, two sons-in-law and four grandchildren.

John Hardie

Patricia Mary Callaghan

Patricia Callaghan, a long-serving member of Council and Hon. Librarian of the Society left us on 1 November aged 88.

Her love of science was strong from the start, and through her various roles - especially as a tutor and researcher at Macquarie University - Patricia kindled a thirst for learning in many young people. She joined the Society in 1984.

A full obituary will appear in a forthcoming issue of the Society's Journal.

John Hardie

New Members

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

Ziggy Switowski – Full Member
Paul Leadbetter – Full Member

We welcome them into the Society.

Archibald Liversidge, FRS: Imperial Science under the Southern Cross

by Roy McLeod

Extract from chapter 8 *Dean and Doctor*

Continued from previous issue

In 1881–82, it was Russell's turn to be President. A *conversazione* in August attracted 600 guests, including the Governor, Lord Loftus, and his Lady, to the Great Hall of the University – continuing a tradition that prospered, with rare interruptions, until the 1920s. The event, the *Herald* remarked, 'had another aspect than that of being merely for the amusement of the visitors, for no one could walk round the rooms without being impressed with the achievements of science'. Among the assembled company were William Manning, the Chancellor, and Justice Windeyer, the Senior Fellow of Senate, upon whom, as we have seen, fell the task of managing Liversidge's ambitions. The Great Hall gave an opportunity to impress, and thanks to Liversidge, the press were supportive. The *Herald*, possibly enlarging upon the truth, reported that the Society 'had [for years] done nothing to distinguish itself, and its papers were, with few exceptions, of no value to science or to the world'. But now all had changed. A generous library, displayed 'with care'; a hall adorned with portraits; a reading room with the latest serials, and, within a few months, an official seal as well – to all these improvements, the name of Liversidge was attached. To his 'zeal and industry', 'never sparing leisure or labour', the Society owed its gratitude. With 'taste and judgement' as well as hard work, 'He has brought all his singular talent for organisation to bear'.

The following year, reviewing the Society's journal for 1881, the *Herald* said as much again: 'Everyone must see ... how rapidly Professor Liversidge is succeeding in raising the Royal Society into what a scientific institution of its character ought to be.' As the editor mused:

> It is not easy to do this in a country where the real science workers are numerically small. At present, his efforts have apparently been devoted to give solidity to the organisation, and make it a valuable centre to aid now and hereafter those who are engaged in original research. It requires something more than zeal – a real genius for method must be added, with a determination that there shall be no makeshifts, but that what is done is done well and permanently done, so as to be of lasting value.

The *Herald* was perceptive. With his self-effacing tact, Russell's diplomacy and Leibius' devotion, Liversidge had welded his 'Elizabeth Street conspiracy' into a reforming lobby. Its enemy was not ideology but inertia. The *Herald* captured an essential point: 'popular sympathy is with the highest work of science to a far greater degree than is ordinarily supposed', its editor observed; and the reformed Royal Society, 'desires no less to popularize than to foster true science'. By so doing, its name was now 'on more lips ... than ever before in its history'. In 1872, the Society was a quiet colonial sideshow; within five years, Liversidge had turned it into a main event.

With a population a tenth its size, Sydney could never hope to embrace the full range of London's cultural enterprise. Yet, by 1886, Sydney boasted several learned societies, a natural history museum, a free public library, an art gallery, an astronomical observatory, a technical college and museum, and a botanical garden. Of these, Liversidge was a trustee of three, a founder of two, an official of one and a friend to all. He had learned to make the most of the city's intersecting élites. To have concentrated his efforts on achieving a single great library, or laboratory, or museum, or even a single great piece of research, would have failed to excite the broad spectrum of support upon which colonial science depended.

In reviewing new books by William Macleay and W.A. Haswell, the *Herald* saw a bright future for Sydney's small scientific community. 'A few years ago, we would no more have thought of producing such works than we now think of fitting out an Arctic expedition. We had not the time, we had not the means, we had not the talent and ability. If we wanted information on subjects lying at our own doors, we had to send to Europe for it.' Now, educated men could read the world's press, and contribute to a learned journal that was part of the world's literature. What had happened required a suspension of disbelief. As was well known, 'young colonies do not attract men of studious habits and scientific attainments; the only wonder is that it is different now'.

From a wider perspective, these changes were not yet decisive, or permanent. Liversidge's reforms were still isolated, individual achievements. But attitudes were changing, and where colonial research might in Clarke's day have been difficult to defend, now Australians were expecting it of themselves. As the pieces fell into place, Liversidge could now turn to an even greater struggle, fostering science not only as a cultural agency, but as a culture in itself.

Science Mobilised: Intercolonial Association

In the years between 1880 and 1886, Liversidge had brought about a kind of vertical integration in the culture of science in New South Wales. On paper at least, the vision embodied in his report of 1880 was now largely realised. There was a vibrant Royal Society, a Technological Museum, a Technical College and a Faculty of Science. Now he could move beyond NSW, and act on his most ambitious project – the federation of Australasian science.

When he returned to Sydney from Paris in 1879, Liversidge had raised a metaphorical Eureka flag among his co-conspirators in Elizabeth Street. In reporting on the geological congress, he admitted that it conflicted with the BAAS meeting (that year, in Dublin); and acknowledged that 'many persons were doubtless surfeited with [such] scientific picnics'. Nonetheless, the value of scientific congresses was well established and, in Australia, they could be copied with profit. Sydney's first International Exhibition, scheduled for 1879, would highlight the colony's scientific achievements as evidence of its cultural vitality. 'I hardly like to propose', Liversidge told his Sydney friends, who doubtless wondered what other ambitious schemes their Honorary Secretary had brought back, 'that a Geological Congress should be held [in Sydney] because the number who

could attend would be such a small one'. Instead, he added prophetically,

> the Royal Society of NSW might, perhaps, with advantage, join with the other scientific societies to hold some special meetings, at which papers could be read and discussed, after the model of the British Association.

Suggested by John Smith in 1866, and by the philosophers of Van Dieman's Land much earlier, the idea of an 'intercolonial BAAS' was not new. But with the passing years, the arguments grew more persuasive. In 1871, when Robert Ellery, Victoria's Government Astronomer, enlisted the help of Henry Russell in making the Australian Eclipse Expedition to Cape Sidmouth, the stage was set for what Michael Hoare has called the 'first real attempt at formal, intercolonial scientific cooperation on any scale'.

Intercolonial cooperation of any kind was propelled by the new technologies of the day, notably the railway and the telegraph. In 1872, Russell conducted intercolonial studies of Australian meteorology, based on data gathered by all six colonies, and relayed by wire among them. The NSW government gave Russell £1000 for his part of the project, and Charles Todd received similar promises from South Australia. The transit observations of 1874 similarly underlined the importance of cooperation, and confirmed official readiness to support it. In 1875–76, Ellery used a trip to Europe to enquire about international meteorological programs, and on his return in May 1877, outlined to the Royal Society of Victoria a plan to transmit astronomical observations across the continent. The same year, the astronomers, with the help of the colonial telegraph departments, began a system of 'weather telegraphy' that linked South Australia, Victoria and NSW.

By 1879, acts of cooperation were not a question of principle, but of political will. During his visit in 1873, Anthony Trollope sensed there was 'little tendency' among Australians to 'that combination which seems to me ... essential to their future greatness'. Yet, he confided to his readers, 'that they will at some time combine themselves I look upon as certain'. Liversidge brought that certainty to life. Could there not be a scheme for regular communication, uniting all the colonies?

What Liversidge wanted was collective action to overcome the triple tyrannies of separation, specialisation and scale. Travel could be made easier by subsidised rail and coastal shipping. Specialisation could be reduced by meeting together. Scale was more difficult. If the scientific community was defined by the number of professional men in the three universities (Sydney, Melbourne and Adelaide), two metropolitan museums, six departments of mines, and a half-dozen technical colleges and mining schools, all would fit into one of his lecture rooms. Adding contingents from New Zealand would not greatly increase their discomfort. But 'professionals' could not afford to ignore the different Royal Societies and the other learned societies, with their aggregate membership of between 2000 and 3000 – mostly amateurs and enthusiasts, but all of whom had much to contribute. Nor should Australia neglect the model of the New Zealand Institute, established in 1867 by the 178 members of the eight provincial societies of that colony. Since the 1870s, Sir James Hector and New Zealand had been an inspiration to Liversidge, and had shown what cooperation could accomplish. Now, with Henry Russell at his side, Liversidge began to see the statue in the marble.

Planning began as early as the Garden Palace in 1879, when Liversidge tried to interest Australian geologists in matters arising from the Paris conference of 1878, which were to feature at their next congress at Bologna in 1881. Few responded, and his efforts failed. Charles Moore mourned that 'it was … impossible for the geologists of each colony to meet together'. But it was common knowledge, as Charles Wilkinson put it, that the geology of each colony must be understood by every other: 'Geological science not only compels a union of workers in the different provinces of Australia, but throughout the world.' Eight years on, with more experience of institution-building behind him, Liversidge determined to try again.

Several factors favoured a fresh attempt. Across the continent, the colonial scientific societies shared a history of genteel poverty, and had at best a fragile hold on life. The press liked to poke fun at what it called their elitism. In Melbourne, what Hoare has called the 'privilege-conscious' Royal Society of Victoria kept potential members at bay. In 1883, Robert Ellery, for many years President of the Royal Society of Victoria, claimed that Australia was 'not yet large enough to maintain, in an effective state, a number of scientific societies'. However, many small interest groups flourished in astronomy and natural history, and there was certainly a market for more. In 1885, Robert Litton, editor of the short-lived *Australasian Scientific Journal* (1885), succeeded in launching a Geological Society of Australasia, with Frederick McCoy and Ferdinand von Mueller as Vice-Presidents. The Society grew slowly, but it attracted members from Victoria, NSW and New Zealand, and showed what might be done. In any case, whether one welcomed diversity, or saw 'fragmentation' as dangerous, it was clear that in 'Unity is strength'. Ellery set about improving cooperation, first with NSW and then beyond.

In fact, relations between the sister societies of NSW and Victoria were already quite warm. In 1878, Nicolai Miklouho-Maclay had played off Victoria against NSW in seeking support for a marine zoological station, which belatedly went to Sydney. But where the societies acted together, benefits multiplied. When, in 1881, the Royal Society of NSW made Frederick McCoy the first Australian recipient of its Clarke Medal, it was not seeking to win favour from of its sister Society. But it was an astute gesture. Similar moves followed. In 1882, Victorians rallied to Sydney when Liversidge and the Royal Society of NSW appealed for help in replacing books and specimens lost in the Garden Palace fire. Cooperation could also lend strength in a range of directions, including Antarctic exploration, in which Victorians and Tasmanians were involved, and in surveys of the tropical north.

Continued in next issue

This excellent book is a 'must read' for anyone interested in the development of science in Australia. It is available from the Society to members at $54 collected or $65 posted (within Australia)

Christmas Party 2010

Join us for our end of year celebration on Wednesday 1 December, in the Cloisters of the historic and delightful St Paul's College at Sydney University (built by Blackett in 1856).
TIME: 8pm (following our Studentship Awards at 6.30 in the Rodgers Room upstairs at St Paul's)
The cost of $30 includes food and drinks.

(see booking form included with this Bulletin)

News from the Royal Society, London

Sir Paul Nurse will take up the position of President of the Royal Society on 1 December 2010, taking over from Lord Rees of Ludlow who has recently hosted the President of our Society at the Royal Society's premises at Carlton House Terrace, London. The appointment of President is normally for five years ending on 30 November.

Sir Paul is a geneticist who works on what controls the division and shape of cells. He was Professor of Microbiology at the University of Oxford, CEO of the Imperial Cancer Research Fund and Cancer Research UK, and is presently President of Rockefeller University New York. He was awarded the Nobel Prize for Physiology or Medicine in 2001 and the Royal Society Copley Medal in 2005.

Notice of RSWA/WAMSI Kimberley Marine and Coastal Science Symposium

Friday 20 May 2011, Western Australian Maritime Museum, Fremantle.

The Royal Society of Western Australia (RSWA) and the Western Australian Marine Science Institution (WAMSI) are jointly hosting the event.

The aim of the Symposium is to provide a seminal proceedings bringing together all the known marine and coastal scientific information for the Kimberley coast and offshore bioregion.

It is anticipated that a volume of peer-reviewed proceedings showcasing those papers will be available at the time of the Symposium.

Registration Fees are $120 for individuals and $60 for RSWA members, concession holders and students. Individuals and RSWA members will receive a copy of the volume of proceedings.

Major sponsors of the event are Woodside Energy, the Australian Institute of Marine Science and CSIRO Wealth from Oceans Flagship.

The Symposium is endorsed by The Royal Society of WA Vice Patron and Chief Scientist Professor Lyn Beazley AO as being:

"An important symposium for Western Australia and one of great relevance nationally and internationally".

Registration forms can requested by contacting Linda McGowan, Executive Officer WAMSI Telephone 6488 4573, Facsimile 6488 4575, Email linda.mcgowan@wamsi.org.au or download from www.wamsi.org.au or www.rswa.org.au

western australian marine science institution

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The Bulletin and Proceedings is issued monthly by the Royal Society of New South Wales
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