



The Royal Society of New South Wales Bulletin and Proceedings 324

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April 2009

Future Events 2009

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 6 May 2009 7pm

A Scientist vs. the Law

Prof Brynn Hibbert

**Chair of Analytical Chemistry
University of NSW**

Wednesday 3 June 2009 7pm

New Environmentally Friendly Approaches to Cooling Buildings

Prof Geoff Smith

Professor of Physics

University of Technology, Sydney

Thursday 30 April 2009 6.30pm

Pollock Memorial Lecture

The Universe from Beginning to End Professor Brian Schmidt

Eastern Avenue Auditorium, University of Sydney. RSVP: 9351 3383 or outreach@physics.usyd.edu.au

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 May 21, at 6.30pm

Mammals from the Age of the Dinosaurs: an Australian perspective

Dr Thomas Rich

see p6

Membership Renewals

Thank you to all those members who have sent in their payments by return. It is most appreciated. We also very much appreciate those donations to the Library and Studentship Fund. You will receive a receipt for tax purposes shortly

Marian Haire

Lecture 6 May 2009, Darlington Centre at 7pm

A Scientist vs. the Law

Prof Brynn Hibbert

Professor of Analytical Chemistry, University of NSW

This will be a largely anecdotal review of the author's work in the courts, including bogus health products, unsuccessful defences of murderers and racehorse trainers, and highly lucrative patent cases.

Ion mobility spectrometry, embodied in instruments such as the Ion Scan, is used at airports to detect drugs or explosives at trace levels. The author has given evidence in trials of drug importation in which an Ion Scan has revealed the presence of a drug with the subsequent seizure of substantive amounts. In an early trial, during the author's evidence, the "invisible hand" defence was coined when the trial judge misheard a question from counsel and caused the following conversation: Judge: "Did you say the hand that touched the cocaine was invisible?" Counsel: "No your honour, I said the cocaine that the hand touched was invisible".

There will be some discussion of statistics (Lies, damned lies and ...), dendrites and fractals, stolen wine, contaminated beer and defunct batteries. This will lead to a reflection on expert opinion and the role of professional societies in maintaining standards of professionalism.

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 200 papers, 6 books and 2 patents. His most recent book *Quality Assurance in the Analytical Chemistry Laboratory* published by Oxford University Press won the RACI Olle Prize for 2007.

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



Pollock Memorial Lecture

The Universe from Beginning to End

Professor Brian Schmidt

Thursday 30 April 2009 6.30pm

Eastern Avenue Auditorium, University of Sydney

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Patrons

Her Excellency Ms Quentin Bryce AC

Governor-General of the Commonwealth of Australia

Her Excellency Professor Marie Bashir AC CVO Governor of NSW

Report of the 142nd Annual General Meeting of the Society Held on Wednesday 1 April 2009

Presidential address: *Constancy amid Chaos: defining our place in the world*

The President, Mr John Hardie, delivered an address about ensuring the future of the Society is secure. He used an astronomical allegory to liken our task ahead to reclaiming our place in the firmament – the firmament of scientific advocacy. He asked whether the Royal Society of NSW can play a part in restoring order in this universe. He stated that through promotional and other work done recently, the Society has created a vacuum which it alone can fill. He warned that time is limited, however, and that the Society must be strategic in its approach. It must maintain its constants, which he defined as its monthly lecture series, Annual Awards, Annual Dinner, Journal, Bulletin, Library and our history.

John asked rhetorically what we need to reclaim. He highlighted relevance, scientific integrity and legitimacy, public prominence and recognition by other learned societies as the key areas to concentrate on.

In reclaiming our place in the firmament, John singled out the following as priorities for the next two years:

- Embrace active fund-raising
- Increase our web presence
- Offer improved membership services
- Create links with other scientific groups
- Increase our exposure to the public
- Improve our academic legitimacy
- Create relevance for teachers and education
- Expand our geographic reach.

In doing so, he warned, we need to be careful that each change is balanced by a concomitant change in other parts of the Society to support it. For example, greater public exposure must be supported by increased office presence, increased membership services must be supported by additions to our website, improved Journal publication must be supported by strict adherence to international citation requirements.

In conclusion John reiterated that the Society continues to have a potentially strong role in the world of scientific advocacy but that

Studentship award to outstanding asthma researcher

At the AGM the President presented the Society's 2008 Studentship Prize to University of Newcastle PhD student Gerard Kaiko. The award was for his research into the link between a viral infection that is the most common cause of lower respiratory tract infection in infants and strongly associates with an increased risk of asthma in later childhood.

Gerard presented an outline of his work to the meeting. He stated that the virus, Respiratory Syncytial Virus (RSV), is typically associated with the diagnosis of bronchiolitis. Gerard has found that a particular type of immune cell, the natural killer or NK cell, is essential for a normal immune response to RSV and protection against hallmark features of asthma. The depletion of NK cells prior to RSV infection in mice gave an immune response that displayed features characteristic of asthma. These included increased mucus in the airways and an increase of a particular type of white blood cell, eosinophils, commonly associated with asthma. In mice lacking NK cells, there was an increase in the production of the types of molecules (antibodies and cytokines) that are characteristic of an asthmatic phenotype. Furthermore, using this model an allergic response could also be generated following exposure to an otherwise innocuous inhaled antigen. Importantly, this research has now also identified the molecular pathway responsible for these interactions.

Gerard writes: '...this study suggests a novel mechanism to explain the association between severe RSV infection and asthma.'

There is little doubt that Gerard Kaiko's exemplary student record will be the precursor to a highly successful future. He is undertaking his studies for a PhD in the Centre for Asthma and Respiratory Diseases in the University of Newcastle, where he graduated with First Class Honours in his Bachelor of Biomedical Science degree and was awarded the University Medal in 2006. He already has an impressive list of full journal publications as well as other prizes and awards.

The Royal Society of NSW is proud to present the Studentship to a student whose work has the potential to lead to an understanding of the cause of asthma and perhaps to a new approach to its treatment.

Robyn Stutchbury

we need to act now to maintain that role. We have survived because of our constants so we must preserve them and build from them. We must fill the vacuum and exercise our legitimacy.

New Council for 2009-10

The President expressed his thanks on behalf of all Members to the retiring Councillors for their service to the Society.

The Annual Report of Council for 2008/9, presented at the AGM, can be found on the Society's website at <http://nsw.royalsoc.org.au/>.

The following were elected to the Council of the Society at the AGM:



<i>President</i>	<i>John Hardie</i>
<i>Vice Presidents</i>	<i>Prof Heinrich Hora Clive Wilmot Robyn Stutchbury</i>
<i>Hon. Secretary (General)</i>	<i>Bruce Welch</i>
<i>Hon. Secretary (Editorial)</i>	<i>Prof Jak Kelly</i>
<i>Hon Treasurer</i>	<i>Marian Haire</i>
<i>Councillors</i>	<i>Alan Buttenshaw Jim Franklin A/Prof Bill Sewell Julie Haeusler</i>
<i>Southern Highlands Rep.</i>	<i>Clive Wilmot</i>

From the President

My recent visit to Canberra provided the Society with some extremely valuable contacts which we need to maintain. It was very important to make these contacts, not only from the point of view of the Society, but also for Science House. I am indebted to Mr Peter Yates for arranging invitations to the RiAus reception and the 'Science meets Parliament' dinner.

Highlights of the trip included:

Attendance at the Annual General Meeting of the Royal Institution of Australia. The new Chief Operating Officer of the RiAus, Damian Scanlon, is keen to develop plans for joint activities with the Society.

Meeting with Dr Sue Meek, the Chief Executive of the Australian Academy of Science. This was a very beneficial discussion, focusing on mutual co-operation between the Academy and the Society, and the clarification of issues surrounding the establishment of the Royal Societies of Australia. We have already been able to send out material related to an Academy event with our Bulletin and hope to continue this practice. Their Publicity Officer is now on our mailing list for the Bulletin and flyers. This will create a wider distribution network for our activities.

Reception for the RiAus at the CSIRO Discovery Centre given by the new head of CSIRO, Dr Megan Clark (appointed January 2009). Speeches were made by the Director of RiAus, Professor Gavin Brown, and the Director of RiGB, Baroness Professor Susan Greenfield. A noteworthy attendee was Dr Frank Fenner, whose portrait I later saw in the new National Portrait Gallery.

'Science meets Parliament' dinner in the Great Hall, National Parliament of Australia. This was held in conjunction with the two-day 'Science meets Parliament' event organised by FASTS where groups of invited scientists have an opportunity to discuss and explain current scientific work with Members and Senators, and to get feedback on it from them. At the dinner I sat next to Senator Alan Eggleston from Western Australia, a former mayor in the Pilbara/Kimberley region and a medical doctor. He introduced me to Senator Kim Carr, the minister responsible for science and innovation in the current federal government.



The 'Science meets Parliament' dinner in the Great Hall

In his address the Senator mentioned that "Innovation is the key to recovery" in the current economic downturn. He enunciated his 10 ambitions for science research.

Through the good offices of Mr Peter Yates, Chair of RiAus, the Society had the opportunity to make up a table at a fund-raising dinner at the Powerhouse Museum to welcome the appointment of the new Director of the RiAus, Professor Gavin Brown, and to hear from the Director of the RiGB, Baroness Professor Susan Greenfield. I invited the Executive Dean of Science at Macquarie University, Professor Stephen Thurgate and his wife Ursula, the Chief Scientist at the NSW Department of Primary Industry, Dr Steve Kennelly, and his wife Peta, and Emeritus Professor Roy MacLeod and his wife Kimberley. Marian Haire, Bruce Ramage and I made up the table. Subsequently Professor Thurgate invited me to Macquarie University to discuss the Society and Science House. This has also been fruitful for the Society and I will mention more about this later.

I have been fortunate in being able to attend the last two meetings of the Southern Highlands Branch, including their AGM last Thursday, and the monthly lecture and dinner. I was honoured to be able to chair the meetings, the first of which was rewarded with a packed house of 101.

Lastly, I was very pleased with the full house in the Barnett Long Room at Customs House on Saturday 4 April to hear our historian, Dr Peter Tyler, and Mr Tony Smith from the City of Sydney give excellent presentations on "Stars in the City", an account of the influence of astronomy on the lives of individuals in the city and on its architecture. The presentations were followed by a concert by three members of the Royal Australian Navy Band.

John Hardie



Professor Penny Sackert addresses the 'Science meets Parliament' dinner

The guest speaker at the dinner was the new Chief Scientist of Australia, Professor Penny Sackert, whom I later spoke to briefly. Also present at the dinner was Professor Mary O'Kane, the new Chief Scientist of NSW.

National Press Club Luncheon where the guest speaker was Senator the Hon. Kim Carr, Minister for Innovation, Industry, Science and Research.



The President with Prof Ian Chubb and Prof Gavin Brown

This was a further opportunity to expand the reach of the Society, as by chance I was sitting next to ATSE (Australian Academy of Technological Sciences and Engineering) people, including the Vice-President, Mr Peter Laver AM, Dr Margaret Hartley, the CEO, and Mr Bill Mackey, the Deputy CEO. The latter has proposed a meeting in Sydney shortly to look at ways in which this academy might work with the Society.

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Introducing our new office manager - Liz de Rome

Liz de Rome has recently accepted the position of Office Manager for the Society. Liz' role, which is part time, will be to promote the profile and activities of the Society in addition to managing the day to day functions of the office. Additional support staff will be recruited in the near future.



Liz has an academic background having worked at the Tertiary Education Research Centre, University of NSW for five years. She subsequently held a number of senior positions in the State and Federal public services before establishing her consulting practice, LdeR Consulting, in 1993. Liz has over 20 years experience in the design of systems change and education programs. Her particular interest is in road safety and in the safe systems approach to integrating engineering, behaviour and public policy to reduce road trauma.

Her work has been recognised by a number of awards including a Churchill Fellowship. In 2006 she was awarded a PhD scholarship by the NRMA ACT Road Safety Trust under the auspices of the George Institute for International Health. She is currently on sabbatical from her company while pursuing her doctoral degree at the University of Sydney.

Liz is an Associate Fellow and member of the National Executive of the Australasian College of Road Safety as well as former Chair of the NSW Division. Her qualifications include M.Ed.(Admin), Dip. Ed and BA, (UNSW).

New Members

Four new members were announced at the April meeting of the Society.

Elizabeth Ellis - Full member

Raymond Josco - Full member

Michael Kelly - Full member

Gillian Curtis - Associate member

We welcome them into the Society.

Stars in the City

On Saturday 4 April the Society, in conjunction with the City of Sydney, held a seminar celebrating the International Year of Astronomy. The packed house in the Barnett Long Room in Customs House at Circular Quay was treated to two splendid presentations.

The first, from our historian, Dr Peter Tyler, looked at the personalities involved in astronomy in the City of Sydney since its founding in 1788. Many of these people were associated with the Royal Society of NSW in one way or another. The second speaker, Mr Tony Smith, an architectural historian from the City of Sydney, looked at the influence of astronomy on the design and location of some Sydney buildings. He pointed out, for example, that Elizabeth Bay House was oriented in such a way that the rising sun at the winter solstice shines straight through the building striking the cliff at the back only on this day.



Tony Smith addresses the full house in the Barnett Long Room in Customs House.

The afternoon was capped off by a splendid performance by three members of the Royal Australian Navy Band.

The afternoon was capped off by a splendid performance by three members of the Royal Australian Navy Band.

John Hardie

Meet your Council Julie Haeusler

Welcome the opportunity to work with Royal Society of NSW in promoting science to all and assist with providing members with a forum to share views and nurture our professional growth.



Since graduating with a Bachelor of Science (University of Sydney) and Graduate Diploma in Education, my work has focused on science education through teaching, resource development and professional learning. My teaching career began at a western Sydney high school in 1982 where it immediately became apparent that my students had quite a different view of science from mine! Many students found

science difficult, dull and different from their lives setting a challenge to excite, interest and engage students in learning science. After ten years in the classroom, I began creating content for students learning science through distance education beginning with printed, audio and video products. A change in direction after 10 years gave me the opportunity to explore the development of web-based multimedia for science, maths and chemistry students in NSW public schools. Now, with widespread availability and access to digital technology, my interest has centred on the convergence of interactive digital technology on what (and how) students learn; how content, pedagogy and technology interact in the learning environment. Oh, and I'm always happy to talk about travel, food and gardening!

One Hundred Years Ago . . .

Proceedings of the Annual General Meeting of the Engineering Section, Wednesday, May 25th 1908.

Mr T. W. Keele, M. Inst. C.E. in the Chair. Thirty six members and visitors were present.

The Chairman's Address was "The Water Supply of Sydney, Past Present and Future", illustrated by lantern slides. This can be found in Journal of the Royal Society of N. S. Wales, Vol XLII 1908 and covers 51 pages.

"In considering the question of a suitable subject for an address to the members of this Section, it has occurred to me that I could not do better than describe, in a general way, the water supply of Sydney, it being a subject to which I have given a considerable amount of attention, and one which will no doubt afford ample scope for discussion, if members think it desirable to enter upon it when I have finished what I have to say on the question."

Mr Keele starts by discussing the Tank Stream and noting that most detailed information was collected by the late Prof. Smith, by searching of old records, and read to the Society on 14th October 1868. "The area drained by this stream was not more than 178 acres, which, although small, was well fitted for the retention of water, there being a spongy swamp at the head of it, extending from where King St is now situated, back towards Park St, and laterally between George and Castlereagh Streets."

He then discusses numerous subjects, a selection of which are: Busby's Bore, 1830 to 1858; Pumping from Botany, 1858 to 1889; The Royal Commission of 1867; Prospect Scheme commenced 1880; The Kenny Hill Scheme; Nepean and Cataract Tunnels, 1885; Hudson Brothers' Temporary Works; Tunnels reported to be collapsing; Alleged instability of Prospect Dam; Board of Water Supply and Sewerage constituted, and retirement of Mr Moriarty; Royal Commission of 1902; Cataract Dam; Estimate of Population and Consumption of Water; Sites Available for Reservoirs on the Existing Catchment Area; The Woronora Scheme; Disposal of the Waste Water for Irrigation Purposes.

Water was a serious problem. Sydney

had suffered calamitous droughts from the mid 1820s to 1839 or so. Mr Keele mentions that Prof Smith found this statement in the Herald in November 1838, "Great distress exists in Sydney ... in consequence of the scarcity of water. The streams from the pipes on the racecourse is very small, so small that the men cannot fill the water carts without waiting four of five hours for a turn. Threepence per bucket is the price now asked, a heavy tax upon poor people. I have been assured by a gentlemen ... that he had to pay as much as sixpence per bucket."

The situation had not improved by the 1870s. "The seriousness of the situation with regard to water supply, experienced during the dry season of 1875 to 1876, caused public attention to be directed to the necessity of taking some immediate action to bring in an additional supply." This led to the Prospect Scheme commencing in 1880 "... the works were ultimately designed by Mr. Moriarty, to convey 150 million gallons per day as far as Prospect, and 50 million gallons per day for five miles beyond it. ... it was not until Feb. 9th, 1880 that the first shot was fired at the Nepean Tunnel, which practically marked the commencement of the great works, which now being completed, now stand as a monument to the founders and minister to our health and comfort in the present day."

"The Nepean tunnel was pierced through on 16th August, 1884, and the Cataract tunnel on 29th January, 1885, both tunnels being ready to deliver water about May 1885." However it took some time for the Prospect reservoir to fill as the years had been very dry and it wasn't until 1887, which was a wet year, that the water attained a sufficient height to feed the canal to the tunnel. "Had it not been for this, there can be no doubt that the situation in Sydney would have been most serious, as the daily flow from the rivers up to the end of November, 1888, was exceedingly small, and the Botany catchment had been almost depleted of water."

"On the 22nd March, 1888, the Board of Water Supply and Sewerage constituted by Acts of Parliament assented to on 10th June, 1880 and 1st March, 1888, came into existence, and took over the control of the works already completed;

those remaining incomplete being still carried on by the constructing authority, the Minister for Public Works. On 1st January, 1889, Mr Moriarty, after seeing his scheme practically finished and in operation, retired from the Public Service."

A Royal Commission in 1902 found the need for yet another dam as the population of Sydney was still rapidly expanding. "They found that the population supplied in 1888 was 296,246, and the consumption of water averaged 8,144,000 gallons per day, equal to 27.5 gallons per head. In 1901 the population supplied was 491,000, and the average consumption was 21,538,000 gallons per day, equal to 44 gallons per head. ... The increased consumption per head ... might be attributed to a variety of causes, such as increased use of water for baths, especially plunge baths, gardens and manufactories. ... the Commissioners were of opinion that, in providing for the future requirements of Sydney, a consumption per head of 60 gallons should be allowed." Cataract dam was therefore commissioned on 12th July 1902, to impound 18,200 million gallons at a cost not exceeding £217,500.

Mr Keele, who was involved with the 1902 Commission, concluded with the remarks "Cataract dam was commenced five years ago and has only just been completed. I have shown that from the records of past rainfall, that in five or six years we shall be in urgent need of more storage than we at present possess, in order to maintain the rate of consumption which I have assumed will be reached by that time, otherwise the citizens may expect to be called upon to submit to restrictions again."

[Compare this to today where the volume per household per year was 280 kL for the year 2000-2001 which is 168 gallons per day. Ref. <http://www.environment.gov.au/soe/2006/publications/drs/indicator/335/index.html>]

Dr Michael Lake,
April 2009

Southern Highlands Branch

Next meeting: Thursday 21 May 2009

Drama Theatre, Frensham School, Mittagong at 6.30 pm

Mammals from the Age of the Dinosaurs: an Australian perspective

Dr Thomas Rich, Senior Curator in Palaeontology at Museum Victoria



Mesozoic mammals were first discovered nearly two centuries ago in England. Despite their rarity, they have been of particular interest to palaeontologists. The first discovery in Australia of a Mesozoic mammal was in 1987:

“When the monotreme humerus was found last August at Dinosaur Cove and I did not get very excited by it, I concluded that my deep initial interest in Mesozoic mammals had faded away and I was really more interested in polar dinosaurs. Only as I peered down the microscope on that evening of 8 March 1997 and saw that tiny jaw with teeth, and realised it was unlikely to be yet another monotreme, did this incredible feeling of elation come sweeping over me. It was a sense of having found the kind of thing I had always sought but had long ago abandoned any realistic hope of attaining. It was a feeling every human should experience at least once in their lifetime.”

Report of April Meeting

Mining the Deep Ocean Floor – A New Frontier by Dr Ray Binns

The lecture was held on Thursday 16th April 2009 in the Drama Theatre, Frensham School, Mittagong. Dr. Binns was introduced by the President, John Hardie, and thanked by Dr Ken McCracken. Dr Binns was formerly from the CSIRO Division of Minerals and Exploration. Attendance was a total of

33, of which 20 were members and 13 non-members.

Dr Binns was team leader of the expedition that discovered huge undersea chimneys, laced with gold and other minerals and swarming with remarkable life forms that were found on the seabed in the Bismarck Sea, north of Papua New Guinea, by the CSIRO Research Vessel Franklin. The find was part of a voyage of discovery by the RV Franklin to probe the mysteries of vast hydrothermal systems on the ocean floor, spewing out plumes of superheated mineral-rich fluids. It turned out to be the richest deposit site, by far, ever discovered on the ocean bed and scientists believe it may be just the tip of an enormous ore-forming system.



This exciting find, that they called the PACMANUS hydrothermal field, is in fact a natural underwater laboratory in the process of concentrating precious metals into ores. And by studying it, scientists are able to unravel how rich ore bodies were formed millions of years ago, thus leading to greater knowledge of mineralization in rocks on land.

Their search was being conducted in an eerie landscape nearly two kilometres below the surface of the ocean. Smoking undersea chimneys pump mineral fluids from deep in the earth's crust into the surrounding seawater forming plumes. Shattered mineral columns resemble ancient ruins, and undersea hills are mantled in snow-white carpets of bacteria and organic hydrates. During the search, Franklin's dredge snagged the huge chimney of a black smoker, a tubular encrustation of minerals. It proved to be 2.7 metres long, 80 cm in diameter at the base, and weighed some 800 kg.

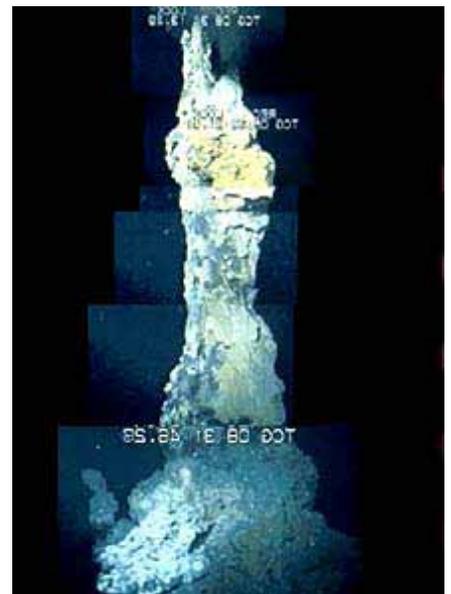
Dr Binns discussed the cooperative partnership between various mining companies to explore the sea floor from the Pacific Rim of Fire for sea floor massive sulphide (SMS) deposits since Papua New Guinea (PNG) became the first country in the world to grant commercial exploration licenses for such deposits in 1997.

Various techniques, for example, the deep-ocean electromagnetic (EM) technique, were carried out in conjunction with its new joint venture partner, Teck Cominco Ltd., and Vancouver-based Ocean Floor Geophysics. Geophysical surveys, both magnetic and electromagnetic, can help pinpoint the best targets. Finally, the vents are sampled by dredging, grab sampling and sediment coring. If the results are promising, core drilling follows.

The first deposit slated for mining, Solwara 1, has inferred and indicated resources of 2.17 million tonnes averaging (at 4% copper cut-off grade)



Giant black smoker retrieved from abyss



*Photograph of black smoker.
Copyright CSIRO Australia.*

7.2% copper, 0.6% zinc, 31 g/t silver and 6.2 g/t gold: small by land-based standards, but one of several high-grade deposits the company is continuously discovering. This gives a value of around US\$400-1500 per tonne.

Although various mining companies hold tenements and exploration licenses off the shores of Papua New Guinea, Fiji, Tonga, the Solomon Islands and New Zealand, many maritime states do not have legislation that would allow commercial exploration in their Exclusive Economic Zones (the area in which a coastal state has sovereign rights over all the economic resources of the sea, seabed and subsoil).

Dr Binns also pointed out that various environmental issues have to be addressed. He noted that there is potential for disturbing unique ecosystems that surround the active vent sites, which sometimes lie in close proximity to the inactive sites that will be mined.

Hub Regtop

RSNSW submission on national science curriculum

The National Curriculum Board (www.ncb.org.au) aims 'to develop an inclusive and futures-oriented national curriculum from Kindergarten to Year 12'. The work of this board has commenced with the release of framing papers for English, mathematics, sciences and history in November 2008. This is the first step in the four-stage process (framing, writing, implementing and evaluating and review). These steps include consultation at key points with teachers, curriculum experts, professional associations and the broader educational community. A response to the National Science Curriculum - Framing Paper was prepared on behalf of the Royal Society of NSW and submitted in February 2009 to the board for consideration. Further consultation will be sought next when the broad outline of the proposed national science curriculum is published later this year. Publication of the final curriculum documents is expected in the latter part of 2010.

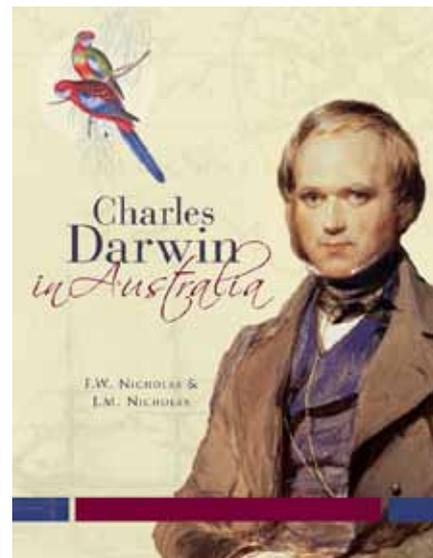
For more information please contact Julie Haeusler on 0410 320 776.

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Charles Darwin in Australia

Cambridge University Press is pleased to offer 20% off *Charles Darwin in Australia - Anniversary Edition* to Royal Society of NSW members.

Early in 1836 Charles Darwin spent two months in Australia as part of his round-the-world voyage on the *Beagle* and during this time he visited Sydney, travelled on horseback to Bathurst, visited Hobart and called into King George Sound. Written in an engaging and lively way that transports the reader back in time, this anniversary edition is beautifully presented in hardback and with colour illustrations by two of Australia's most famous early artists, both of whom had been Darwin's *Beagle* shipmates earlier in the voyage.



The book's husband and wife team are Frank Nicholas, Emeritus Professor at the University of Sydney and Jan Nicholas, a retired librarian whose knowledge of the Martens collections in the State Library of NSW was a major impetus for the work.

To read more about the book and receive the discount, please go to: www.cambridge.edu.au/cdarwin9. Alternatively, you can order directly by calling Chrisi Kirova on 03 8671 1442.



Sydney University's Darwin Anniversaries website is now live at: <http://www.science.usyd.edu.au/darwinanniversaries/>

2009 marks the bicentenary of Charles Darwin's birth and the 150th anniversary of the publication of his work, 'On the Origin of Species'.

Darwin's work culminated in his theory of natural selection which radically transformed our understanding of both the origins of life and the relationship between the environment and all species on Earth.

In celebration of Darwin's work The University of Sydney is hosting a series of events during 2009 as an exploration of all things Darwinian. These events focus on the success of Darwin's work at his time and on the progress that has been made since Darwin's seminal work.

In an intellectual tour de force, University of Sydney researchers will present their thoughts on how Darwin's ideas can be applied to other domains of science and make their predictions on the Darwinian future.

Charles Darwin Down Under 1836

State Library of New South Wales

Free exhibition until 26 July

Discover Darwin's little-known adventures in Australia – a landmark journey that changed his life forever! View original artworks, letters, diaries and the Library's first edition copy of *On the Origin of Species*.



Also you can book now for the curator talk with Paul Brunton on Tuesday 28 April, 5.30pm for 6pm, \$22

Southern Highlands Branch February Meeting

Professor Bob Carter

How Dangerous is Human-Caused Global Warming?

The lecture was held in Clubb Hall, Frensham School, Mittagong on Thursday 19 February 2009.

Professor Bob Carter of James Cook University was introduced by Ted Smith

Through local newspapers and other media advertising it was exciting to see such a great number of new faces from as far as Wollongong, Sydney and Canberra, as well as people from all over the Southern Highlands. It demonstrated that Global Warming is still of great interest irrespective of the current economic crisis.

Professor Carter gave a most impressive, passionate, understandable, enjoyable and most of all a scientific explanation that Climate Change has been scientifically observed and measured for thousands if not millions of years. The only question was whether man-made carbon dioxide has contributed to so-called Global Warming.

Professor Carter pointed out that the IPCC warned politicians and industrial societies and their economic advisers to implement policies to stop global warming by inhibiting green house gasses, notably carbon dioxide emissions into the atmosphere. However, Professor Carter pointed out that this was based on computer modelling leading to advice on economic grounds of how to overcome the global threat of future climate change. As he pointed out, no-one can predict the way in which climate will change in the future, beyond the fact that multi-decade warming and cooling trends and abrupt climatic changes are all certain to continue.

Professor Carter pointed out that the IPCC has been comparing climate change with that of the last 150 years of instrumental temperature records, sometimes back around 1000 years using proxy measurements such as tree ring measurements, which he claimed was a ridiculously short period of time to understand climate change. Using climate records that represent the last million years, palaeoclimatologists and palaeoceanographers have established a sound understanding of natural patterns of climates using evidence from sediment cores from beneath the sea floor as well as ice core samples from Greenland and polar ice caps. Evidence that he presented was that during the Pliocene period (between 3.5 and 6 million years ago) the global temperature was oscillating around 2-3 C warmer than today, and after that the global temperature has been on a steady decline. Compared to ancient climate records temperatures during the late 20th century were neither particularly high nor fast changing, as for example temperatures in the Antarctic for three interglacial periods that preceded the Holocene period were 5 C warmer than today and 2-3 C warmer during the Pliocene period. He also showed there has been no warming since 1998 despite an increase of carbon dioxide of about 15 ppm (5%) and there is evidence prior to the Holocene period that atmospheric carbon dioxide attained levels of 1000 ppm and more without known environmental effects.

Professor Carter pointed out that the IPCC asserted that human influence on climate change showed unprecedented warming as thermometer based ground temperature recordings showed. This was the claim made by Mann which led to the "hockey stick" model of climate change as presented by Al Gore in his *An Inconvenient Truth*, which was shown later by McIntyre to be deeply statistically flawed. Professor Carter also showed evidence that over the last 6 years the estimated global lower troposphere and ground surface temperature records indicated that during this period there has been significant cooling and that this cooling has succeeded the mild 20th century warming.

In his conclusion Professor Carter asserted that natural climate changes and variation are going to continue and that droughts, storms, bushfires, flooding will be expensive to adapt to, but adaptation will not be aided by imprudent restructuring of the world's economy by emission trading or controls in the pursuit of stopping the allegedly dangerous human-caused global warming that can neither be demonstrated nor measured.

His complete talk can be referenced in his article "Knock, Knock: Where is the Evidence for Dangerous Human-Caused Global Warming?" in *Economic analysis & policy* Vol.38 No.2 September 2008.

Attendance at the meeting was a total of 178 of which there were 44 members, 129 non members and 3 teachers and 2 journalists. A vote of thanks was proposed by Hub Regtop.

Hub Regtop

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