



# The Royal Society of New South Wales Bulletin and Proceedings 347

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July 2011

## Future Events 2011

Lectures in Sydney are held on the first Wednesday of the month at 6:30pm at the University of Sydney.

Wednesday 3 August 2011 at 6.30pm

### **1194th OGM Schizophrenia: from Neuropathology to New Treatments**

**Prof Cyndi Shannon Weickert,  
Macquarie Group Foundation Chair  
of Schizophrenia Research, UNSW**

Seminar Room 102, New Law School  
Building, Eastern Avenue, University of  
Sydney

## **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.

Thursday 18 August 2011 at 6.30pm

### **Heading towards the world's largest telescope - the Square Kilometre Array**

**Prof Michael Burton, UNSW**

Drama Theatre at Frensham School,  
Mittagong (enter off Waverley Parade)

## **Central West Branch**

For further information please contact  
Kerry Madden at Charles Sturt University  
Orange on Tel: 02 6365 7500.

## **The 1194th Ordinary General Meeting Schizophrenia: from Neuropathology to New Treatments**

**Professor Cyndi Shannon Weickert, Macquarie Group  
Foundation Chair of Schizophrenia Research, UNSW**

Wednesday, 6 August 2011 at 6:30pm Seminar Room 102, New Law School  
Building, Eastern Avenue, University of Sydney

Professor Weickert's research is focused on the molecular developmental neurobiology of schizophrenia. She earned a PhD in Biomedical Science at Mount Sinai School of Medicine, New York City and completed postdoctoral training at the National Institutes of Mental Health rising to the level of Unit Chief of MiNDS (Molecules in the Neurobiology and Development of Schizophrenia). Her awards include the Eli Lilly Young Investigator Award, NIH Fellows Award for Research Excellence, Independent Investigator Award and two Young Investigator Awards from NARSAD. She has lectured throughout the world and contributed to over 90 publications.



The primary focus of the Molecular Neurodevelopmental Schizophrenia Research Laboratory is to understand how genetic variants of hormone receptors and growth factors impact on the development and function of the cerebral cortex during adolescence and how these factors may be altered in schizophrenia. Genetic variants of several developmentally important genes have been associated with schizophrenia, however the mechanism by which these variants lead to the disease is unknown. Currently, they are exploring the molecular mechanism of how alterations in oestrogen receptor and neuregulin may act to bring about schizophrenia by examining human brain tissue and primary neuronal culture. They are also directly analysing human genomic DNA and performing comparative genomic studies that are aimed at more clearly pinpointing DNA sequence variations in susceptibility genes that may be critical in determining the vulnerability to schizophrenia.

**Booking is not necessary. All welcome. Entry is free to RSNSW members.  
There is a charge of \$5 for non-members.**

## **Patrons of The Royal Society of NSW**

**Her Excellency Ms Quentin Bryce AC  
Governor-General of the Commonwealth of Australia**

**Her Excellency Professor Marie Bashir AC CVO  
Governor of NSW**

## Report on the Society's 1193rd OGM

### Stem cells and regenerative medicine: prospects for realising the Prometheus myth

Professor John Rasko, Centenary Institute



Professor John Rasko was appointed to the first clinical gene therapy position in Australia. Currently, he is head of the gene and stem cell therapy programme at the Centenary Institute and is a Professor in the Faculty of Medicine at Sydney University. At the general meeting of the Society on Wednesday 6 July, Professor Rasko gave a wide-ranging talk on the status of cellular therapies for regenerative medicine and cancer treatment and the potential and use of both embryonic and adult stem cells in the treatment of a wide range of diseases. Importantly, there was a comprehensive discussion on the ethical issues in relation to the use of both embryonic and adult stem cells, not only in the treatment of disease but also the implications for technologies such as in-vitro fertilisation.

The Centenary Institute has a large research programme for cellular medicine and extraordinarily sophisticated facilities for the manufacture and cultivation of biological material. This includes four specialised laboratories with hyper-pure air flow, positive air pressure differentials, both for preventing contamination and the release of biologically-active material and sophisticated human-access protocols.

Research programmes include techniques such as extraction and cultivation of red cells and bone marrow prior to treatments such as chemotherapy and radiation therapy in order to speed up patient recovery and exploring the extent to which adult stem cells might be used

as a source of genetic material to help rebuild damaged organs such as the liver, and blood and bone marrow.

Professor Rasko explained the potential of embryonic stem cells that, one day, might be used to treat a range of diseases by replacing damaged or diseased tissue. Embryonic stem cells are taken from embryos at the time when little differentiation between cells has yet taken place. These stem cells theoretically are able to be cultivated and differentiated as "master cells" that could produce all types of fully-differentiated tissue in the body. Despite the theoretical potential for these, progress has been slow. The medical drawbacks of using embryonic stem cells are that the embryo has the same immune signature as the mother and father, so recipients of tissue cultivated from these cells would need constant immunosuppressant therapy. So far, only three clinical trials have been undertaken. But a more significant challenge for embryonic stem cells may well be the moral issues. Pro-life groups have opposed the use of embryonic stem cells because they believe that cells taken from an embryo have the potential to form a complete individual; to them, destroying such an embryo amounts to taking a human life.

An alternative to using embryonic stem cells is to take adult cells and to reprogram them to make them the same as embryonic cells. In the last few years, there appears to have been significant progress in making so-called "induced pluripotent stem cells". If this technology turns out to be viable (and there are still many challenges that have been identified), it could solve a number of the issues of embryonic stem cells. For example, because adult cells could be taken from the individual requiring treatment, induced pluripotent stem cells could be used without the need for immunosuppressant therapy. It also avoids the moral controversy that surrounds the destruction of an embryo. But this may not be the panacea that many had hoped for. There are two medical disadvantages in "reprogramming" cells: two of the transgenes required are oncogenic so

pose an enhanced risk of inducing cancer in the patient; and the viruses used to carry the transgenes can be incorporated into the genetic material of cells and the consequences of this are unpredictable. It also appears that the older the organism, the more abnormalities there are in the resultant stem cell. Furthermore, the ethical issues may not be solved either. To date the efficacy of all adult stem cells need to be compared against embryonic stem cells, so the research programmes cannot be separated. In addition, there is the moral argument that if every cell in your body has the potential to produce a full range of differentiated cells (perhaps even a fully-formed individual) then it could be argued that every cell in your body has the same moral status as you do!

Donald Hector

### From the President



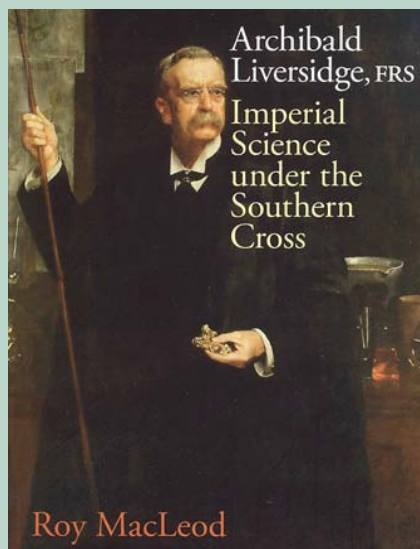
Since my last report, our Science House initiative has moved forward a fraction. Tony Nolan, our Hon. Treasurer and Hon. Librarian, and Bruce Welch, our former Hon. Secretary, and I attended a meeting with staff of the Planning Minister, Brad Hazzard, together with a senior official from the Sydney Harbour Foreshore Authority on 5 July about the prospects for Science House once again taking on the role of a Science Centre for Sydney and NSW. While nothing concrete came out of the meeting we were left with the feeling that there might be some form of positive outcome. I will keep you up to date as we pursue the matter further.

This year marks the 150th anniversary of the death of Sir Thomas Brisbane, the President of our antecedent society, the Philosophical Society of Australasia. It is also the 200th anniversary of the building of his first observatory

in Scotland. To mark these important events the Society is joining with the National Trust of Australia (NSW Branch) and the Parramatta Park Trust to hold a celebration in two parts at the beginning of December. The first event will be an early evening seminar about Brisbane's legacy in Australia on Thursday 1 December at the National Trust, Observatory Hill in Sydney in which three Brisbane scholars will present talks. The following Saturday, 3 December, there will be a visit to Brisbane's observatory at Old Government House in Parramatta Park in the late afternoon, with the possibility of night sky viewing afterwards. Further details of these events will appear in forthcoming Bulletins. I would encourage you to mark these dates in your diaries now and I look forward to seeing you there.

John Hardie

## Archibald Liversidge, FRS: Imperial Science Under the Southern Cross — Members' Discount



The Council is pleased to extend its offer of a 10% discount to Members on this superb book.

A joint publishing effort between the Society and Sydney University Press, this book is a detailed narrative of the progress and beginnings of scientific inquiry in Australia. It shows how central our Society was to the development of rigorous scientific research in Australia and how our development was intertwined with that of the university.

Now \$54 collected or \$65 posted (within Australia).

## Southern Highlands Branch

### Report on June Meeting

#### Why Did I Do That?

#### Dr Hugh Mackay

The Branch held its June meeting at 6.30pm on Thursday 16h June in the Drama Theatre, Frensham School, Mittagong. Dr Hugh Mackay was welcomed by an enthusiastic audience of 60 people.

As a social researcher, Dr Hugh Mackay has spent most of his life exploring why we do the things we do. For fifty years, he has listened to subjects talking about their dreams, their hopes, their fears, their disappointments and their passions. After psychological analysis and reflection on the data he has amassed over so many years, Dr Mackay has recently released his 13th book, *What Makes Us Tick? - The Ten Desires that Drive Us*. It was the subject matter of this book that largely formed the basis for this fascinating June lecture.

Hugh Mackay identifies ten key social desires linked to personality, identity and relationships, these desires influencing our approaches to love and friendship, family, self-image, work and community. Although he clearly describes ten key areas, he emphasized at the start of the lecture that these desires are delicately and intricately intertwined, and although each can be readily recognized in its own right,

they are all connected as if in a large web. They therefore are not placed in any order of importance by him, and he stated at the outset that frustration of one can lead to overcompensation in another.

The first social desire that Dr Mackay chose to discuss at length was the desire of people to be taken seriously. Simple examples where subjects did not feel they were being taken seriously included being ignored by the waiter in a restaurant, or feeling uncomfortable because the person they were chatting to at a party kept looking over the subject's shoulder to catch the eye of someone presumably more interesting. Mackay believes that the yearning to be taken seriously underlies much human behavior, because it is an acknowledgement that the individual is a unique and significant person.

As the lecture progressed, Mackay moved on to discussion of other social desires that explain human behavior and responses. He talked of the desire to belong, the desire to connect, the desire for control, the desire to feel useful, and the desire for love. For each desire, he identified a shadow, the dark side of the desire which if left unchecked or overplayed, can lead to damage to ourselves and others. Such an example was the desire for "my place" which can often be seen in a negative



sense as territorialism – a threat to civilized society unless it is tempered with generosity and compassion.

Hugh Mackay's lecture was extremely well received. The material was thoroughly researched, and the findings, analysis and interpretations were presented in the Mackay inimitable style. Question time was generous, and the large audience was indeed left with the impression that they had been "taken seriously".

The vote of thanks was given by Anne Wood.

Anne Wood.

## Southern Highlands Branch

### August 18th Lecture:

### Heading towards the world's largest telescope – the Square Kilometre Array



**Professor Michael Burton - School of Physics, University of NSW**

Radio telescopes can be used to detect some of the weakest signals that nature produces, signals that have travelled across the universe to reach us, created by events such as the formation of stars, galaxies and even the universe itself. Collecting, analysing and interpreting such signals presents

one of the greatest scientific challenges before us. Technology now allows us to take the next step in this exploration of the universe, to build a radio telescope with one hundred times the collecting area of the current generation of telescopes, covering a full square kilometre of collecting area. The dishes themselves would be spread out over an area the size of a continent. The telescope will be known as the Square Kilometre Array or SKA. One crucial factor that limits our ability to measure the faintest radio waves is artificial interference, created by the myriad of communication devices our civilisation now uses. Australia, with its vast areas of sparsely populated land, has the lowest radio interference environment of any country, making it a prime contender for the siting of this telescope. This talk will describe the background to the SKA, why it is being built, some of the science questions it will tackle, and the significant progress now being made towards building what will become the world's largest telescope.

Michael Burton is an Astrophysicist at the University of New South Wales. His speciality is studying how stars form in the cold, dark clouds of interstellar space. Here he uses millimetre-wave radiation, the very highest energy radio waves, to measure the emission from the rich molecular soup that these clouds are composed of. He has also been a pioneer in the development of astronomy in Antarctica, where the extreme dry and cold conditions open up new windows into space in the infrared portion of the spectrum. For his day job Michael lectures undergraduate students on the wonders of physics. Michael recently became a member of the Society after presenting a talk at our 1191st OGM.

### Announcements

We are bringing back letters to the Editor. If you have any announcements, interesting items, or an opinion you would like to voice, then please email it to the office.

### New Members

Three new members were announced at the July meeting of the Society:

Michael Burton – Full Member

Catherine Gitau - Full Member

Robert Liston Busby - Full Member

We welcome them into the Society.

### Contact your office bearers

John R Hardie President	02 9363 9360	Prof Heinrich Hora Vice President	02 4627 7769
Clive Wilmot Vice President (SHB Rep)	02 4886 4199	Prof D. Brynn Hibbert Vice President	02 9398 9134
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Prof. Bruce A Warren	02 9665 7537	A/Prof Maree Simpson (C/W Branch)	02 6365 7818
Julie Haeusler	02 4829 2202		

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