The Royal Society of WA in association with The University of WA presents
2005 Nobel Prize Laureate Professor Barry Marshall
September 18th 2006

7:00 pm Octagon Theatre (RSVP)

Welcome Speech by the Minister for Science
Hon Francis Logan

Barry Marshall one of Australia's eleven Nobel Prize Winners, together with Robin Warren received the Nobel Prize in 2005 for their discovery in 1982 of the *Helicobacter pylori* bacterium which causes stomach ulcers and gastritis.

For over a decade, while undertaking research at Fremantle Hospital, Dr Marshall's research challenged established medical dogma that peptic ulcers were a chronic condition requiring a lifetime of treatment. Today, the discovery that it is *Helicobacter pylori* bacterium which causes stomach ulcers and gastritis is recognized as one of the greatest breakthroughs in medicine since the polio vaccine. The discovery has meant that this chronic and disabling condition can now be permanently cured by antibiotics to the benefit of millions of patients worldwide. Dr Marshall and Dr Warren’s pioneering work also has stimulated research worldwide to better understand the link between chronic infections and diseases such as cancer. Immediate outcomes of their research include advances in the diagnosis of gastritis and ulcers, including antibody tests, and urea-breath tests.

Barry Marshall completed his undergraduate medical degree at The University of Western Australia in 1974 where he is currently Senior Principal Research Fellow, School of Biomedical, Biomolecular and Chemical Sciences where he continues research related to H. pylori, and runs a molecular biology laboratory. The many prizes Professor Marshall has received for his research include: Warren Alpert Prize with Dr Robin Warren in 1995; The John Scott Award, City Of Philadelphia, 1995; The Gairdner Award, Toronto Canada, 1996; The Albert Lasker Award in 1995; The Paul Ehrlich Prize with Dr Warren in 1997; The Dr A.H. Heineken Prize for Medicine in 1998; The Florey Medal, Australia in 1998; Benjamin Franklin Medal for Life Science in 1999; The Prince Mahidol Award in the field of Public Health Thailand, in 2001; The Keio Medical Science Prize in 2002; and the Nobel Prize for Physiology or Medicine which he shared with Dr Warren in 2005.

This issue of the RSWA Proceedings was edited by Margaret Brocx <rswa@iinet.net.au>

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1 Booking essential - Octagon Theatre 6488 2440 or rswa@iinet.net.au
August Talk
Dr Phil Playford - The Tamala Limestone: its characteristics, origins, and dangers

Some 55 members, guests and the public attended the Royal Society of Western Australia Ordinary Meeting on 21st August 2006 to hear Dr Phil Playford present his talk on *The Tamala Limestone: its characteristics, origins, and dangers*. Dr Playford commenced by describing the Tamala Limestone in terms of its distribution, functions as an aquifer, origin, age, and where it is exposed.

The Tamala Limestone occurs as a narrow coastal limestone strip between Shark Bay and the Augusta region. Originally called the Coastal Limestone, then the Tamala Aeolianite, it finally came to be known as the Tamala Limestone. It originated as coastal sand dunes with marine comminuted shell contributing to its formation. Throughout its development, it also had soils formed on the former dunes, and these are now fossil soils. Dr Playford focused on imagery and sections in the Shark Bay area to describe the tectonics of the region, the type section of Tamala Limestone, and the relation of the Limestone and the Peron Sand.

Dating using optically stimulated luminescence (OSL) showed ages of the limestone at the type section to be 205 000, 215 000, 230 000, 270 000, showing the section was formed circa 250 000 years ago during the Mindel Glaciation, rather than the Riss Glaciation. Dr Playford showed a side scan radar image of the Edel Land Peninsula with the long dunes that characterise the Edel Land Peninsula along its east coast, which he considered to be formed during arid times of the last glacial period.

Focused now on Kings Park Dr Playford described the collapse of cliff in the limestone, such as along Mounts Bay Road. The illustrations showed the limestone is soft, with a hard top layer, with solution pipes filled with yellow sand (the solution pipes were considered to be formed from the tap root of trees), and with abundant fossil roots (rhizoliths). The limestone, exposed in a quarry at Fremantle, similarly showed a hard top, and with solution pipes filled with yellow sand. The best exposure of limestone in this region is at Rottnest Island: strong outcrop develops the headlands of the Island. Shore platforms characterise the limestone along the coast.

At Rottnest Island and everywhere where the limestone is exposed, it is hazardous – there are rock falls, landslides, and slumps occurring all the time, resulting in unstable cliffs that can pose a serious threat to the public.
Dr Playford then moved on to the story of the Gracetown tragedy due to the limestone cliff collapse in 1996, outlining the history behind the collapse.

The presentation was followed by question time and refreshments

**Scar of cliff slump at Gracetown**

**Rescue following the Gracetown cliff collapse**

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**Science Week Events August 2006**

The Royal Society hosted five successful events. Two were in Perth, with a theme of Forensic Science, and three in regional centres, i.e., Bunbury and Karratha, dealing with some natural history features. The Bunbury event, on *The Leschenault Inlet estuary*, was in collaboration with the Leschenault Catchment Council. The Forensic Science events in Perth, *The Mysteries of Forensic Science* at SciTech, *and Forensic Science in Action* at UWA, were partly funded by the Department of Education Science & Technology, and sponsored by SciTech and B&H Australia. The two Karratha events *Mangroves of the Pilbara* were in collaboration with the Department of Environment & Conservation, and partly sponsored by the Seminar Centre TAFE Karratha.

**Bunbury - The Leschenault Inlet estuary,**

On Monday evening, 14th August, The Royal Society of Western Australia opened Science Week for 2006 at the Rowing Club, Bunbury, with a session on "The Leschenault Inlet estuary", in collaboration the Leschenault Catchment Council. Despite the inclement weather, some 60 people turned up to this event, and learned about how the estuary formed, how it operates hydrodynamically and hydrochemically, and what are the components of the ecosystem. The audience also examined the invertebrate estuarine fauna and the mangrove with microscopes.

**Bunbury: Educating the young: microscope work on Leschenault Inlet fauna**

Dr Vic Semeniuk, Margaret Brocx, and Joy Unno represented the Royal Society at this event. The session was organised and run by Vic Semeniuk, with presentations, displays, and hands-on activities. Margaret Brocx and Joy Unno assisted with the microscope work and explained the posters.
The University of Western Australia: Forensic Science in Action

The next event for Science Week was a daytime morning and an afternoon session on Wednesday 16th August for 60 High School students in Perth at the Centre for Forensic Science, The University of Western Australia.

At this event, students had the opportunity to discuss with scientists and police officers the nature of forensic science, the breadth of sciences it encompasses and the disciplines they will encounter during a hands-on activity "to solve a case". Students encountered hands-on activities that included Chemistry, Entomology, Palynology, Geology, Soil Science and Micropalaeontology.

The activity was developed and conducted by Dr Lynne Milne, A/Prof. Ian Dadour, Prof. John Watling and Mr Robin Napper of the Centre for Forensic Science, and Ms Jenny Bevan, Education Officer and Curator of the Geology Museum, the School of Earth and Geographical Science and the enthusiastic postgraduate students at the CFS.

SciTech: The mysteries of Forensic Science

On Thursday evening 17th August at SciTech, West Perth, some 160 people attended an evening event entitled "The mysteries of Forensic Science". Dr Lynne Milne and Dr Ian Dadour organised and supervised this event. The evening consisted of table displays, posters and microscopes illustrating forensic science in terms of forensic DNA analysis, forensic chemistry, forensic anthropology, forensic palynology, and forensic entomology, with the attendees obtaining first hand experience in handling materials and microscope to see how forensic scientist tackle problems a variety of materials in solving crimes.
Pilbara – Mangroves of the Pilbara
On Friday evening, 18th August, some 50 people attended a presentation by Vic Semeniuk at the Seminar Centre, TAFE Karratha, to learn about the mangroves of the Pilbara. The talk was followed by microscope work to examine mangrove plant material. The following morning, an excursion was run to show mangrove ecology, mangrove adaptations, and mangrove anatomy first hand in the field.

Mangrove anatomy investigated first hand in the field.

Some of the excursion attendees walking along the edge of the mangrove at Hearsons Cove

The July 2006 issue of the Bioenergy Australia newsletter (22 pages) is now available for downloading in PDF, HTML or zipped Word format. The web address is http://www.bioenergyaustralia.org.

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RSWA Events Calendar

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<tr>
<th>Date</th>
<th>Time</th>
<th>Venue</th>
<th>Event</th>
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<tr>
<td>Mon 18th Sept</td>
<td>7:00 pm</td>
<td>UWA Octagon Theatre</td>
<td>Nobel Prize Laureate Dr Barry Marshall: H. pylori</td>
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<td>(RSVP Ph 6488 2440)</td>
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<tr>
<td>Mon 16th Oct</td>
<td>7:00 pm</td>
<td>Kings Park</td>
<td>Seminar on climate patterns</td>
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The School of Earth and Geographical Sciences and the Institute of Advanced Studies invite you to a free public lecture on:

The Role of Refugia in Biotic Nature Conservation

Monday, 11 September 2006 at 6pm at the Joseph Gentilli Memorial Lecture

University Club Theatre Auditorium

Jamie Kirkpatrick School of Geography and Environmental Studies, University of Tasmania

A refugium is a refuge for organisms in environmentally inclement times. Refugia may be contemporary, as in the case of Australian alpine ecosystems, or historical, as with the last glacial rainforest refugia in eastern Australia. Many species that were confined to last glacial refugia have yet to attain their potential range in the brief warmth and wetness of the Holocene. Past refugia have been identified by the coincident ranges of local endemics and climatic reconstructions based on microfossil evidence. It has been argued that an obvious implication of past refugia for long term nature conservation planning is the necessity to protect them, and the pathways to them, from development.

In some cases the protection of pathways may have been effectively rendered impossible, implying that people will need to transport species over gaps as we slide into the next glacial period. The importance of refugia in biotic nature conservation has been recognized in world heritage criteria and Australian criteria for the conservation of forests, without necessarily being applied systematically in conservation planning. Yet, in the longer term, such systematic protection will be vital for the survival of most of the rarer species on our planet.

Jamie Kirkpatrick is Professor in the School of Geography and Environmental Studies at the University of Tasmania and Vice-President of the Institute of Australian Geographers. His main loves are alpine, grassy, coastal and garden ecosystems, nature conservation and understanding the politics of environment. He has been recognized by several national awards and prizes for his work developing methods for planning reserves and his contribution to forest conservation and world heritage matters, and has been recognized internationally for producing the seminal work on minimum set reservation planning methods. He has published more than 190 refereed papers and more than 20 books, several of which make ecological knowledge accessible to the general public. His books include: The Ecologies of Paradise: Explaining the Garden Next Door, Pandani Press, 2006; A Continent Transformed: Human Impact on the Vegetation of Australia, 2nd ed OUP, 1999; Alpine Tasmania, OUP, 1997 His major current research projects seek to gain an improved understanding of the effects of firegrazin interactions on vegetation dynamics, and the causes, and conservation implications, of variation in the composition and structure of domestic gardens.

All Welcome. No RSVP required. For more information please contact the Institute of Advanced Studies: Telephone 6488 1340 email: ias@admin.uwa.edu.au www.ias.uwa.edu.au