The Royal Society OF VICTORIA
Promoting science since 1854

PATRON: The Hon Linda Dessau AC
Governor of Victoria

PRESIDENT: Mr David Zerman

## This Month's Events…

**6th July:** *Taking Care of Nature: Linking Backyards to Bush*

*A joint workshop with **Gardens for Wildlife Victoria** and the **Victorian Environment Friends Network***

**25th July:** *Social Work: Collaborative Human-Robot Interaction*

*With **Professor Elizabeth A. Croft***

**26th – 27th July:** *Campfires & Science: Wild DNA at Toolangi*

# July 2019 Newsletter

*Print Post Approved 100009741*

The Royal Society of Victoria Inc.
8 La Trobe Street,
Melbourne Victoria 3000
Tel. (03) 9663 5259
rsv.org.au

## Advance Notice

## National Science Week @ RSV:

**8th August:** *Mind over Faecal Matter: Gut Biome & Mental Health*

*With **Associate Professor Elisa Hill-Yardin** & **Associate Professor Ashley Franks***

**9th August:** *Science at the Extreme (launch at Melbourne Museum)*

*With **Dr Darlene Lim, Dr Kate Selway, Dr Dianne Bray** and **Mr Nate Byrne***

**10th August:** *Extrasensory (main event at the Parliament of Victoria)*

**14th August:** *Stories from the Cosmos: what Indigenous storytelling can teach us about memory*

*With **Dr Simon Cropper, Ms Kat Clarke, Dr Lynne Kelly, Dr Duane Hamacher** and **Dr Meredith McKague***

**15th August:** *Young Scientist Research Prizes*

## Taking Care of Nature: Linking Backyards to Bush

**Saturday, 6th July 2019 from 9:30am to 3:00pm**

Hear fascinating stories of people caring for nature in diverse places, from schools to suburban gardens, creeks and nature reserves. How can this work transform a landscape? How do you start? Be inspired, learn what you can do, network and get involved!

Speakers include **Peter Noble** (Ballarat Environment Network – linking groups to transform landscapes), **Irene Kelly** and **Kerry Davies** (Knox Gardens for Wildlife – linking schools and gardens for wildlife), **Anthony Bigelow** (First Friends of Dandenong Creek – crowdfunding and revitalising a Friends group), **Charlotte Fletcher** (Cranbourne Gardens, helping bandicoots from reserves to suburbs), amongst others. There will also be interactive sessions and networking.

Morning tea and lunch served. Places are limited – please book if you know you can come. We look forward to seeing you there!

gardens for wildlife | VICTORIA

Victorian Environment FRIENDS NETWORK

Eventbrite

**Register online** now at https://rsv.org.au/events/backyards-to-bush/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, or entering their **promotional code** in the online ticketing window.

## Campfires & Science: Wild DNA at Toolangi

**Saturday, 27th July 2019 and Sunday 28th July**


Join us for the latest 'Campfires and Science' event at Toolangi, where we'll be teaching people how to look for critically endangered animals and leading trips to plant trees and remove invasive species.

We'll be joined by Taungurung man, Shane Monk, who will give a Welcome to Country and a 'walk and talk' education session in the forest. We'll also be learning how to gather DNA samples in the wild and analyse them in the forest with a portable 'lab'.

**Please note: **a free vegan dinner is included**. Unfortunately we cannot accommodate allergies; if you have any special requirements, please ensure you have catered for yourself.

Eventbrite

**Register online** now at https://rsv.org.au/events/wild-dna-at-toolangi/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

# Victoria's Regional Forest Agreements: Conservation of Soil and Water Resources

**Thursday, 25th July at 1:30pm**

## Speakers:

**Dr René Van der Sant**
Land Asset Practitioner, Melbourne Water

**Professor Patrick Lane**
School of Ecosystem and Forest Science, The University of Melbourne

**Mr Jason Alexandra**
Managing Director, Alexandra & Associates

**Ms Rachel Brown**
Senior Project Officer, Hydrology & Climate Science Team, DELWP

**Dr Tim Peterson**
Research Fellow, Department of Infrastructure Engineering, The University of Melbourne

Join us for the fourth in this series of public lectures, looking at the scientific evidence base informing the modernisation of Victoria's Regional Forest Agreements. You will hear from scientific experts leading the assessment of Victoria's public forest values and join the panel discussion to follow.

At this lecture, speakers will be addressing Criterion 4 of the Commissioner for Environmental Sustainability's State of the Forests Report, "Conservation and Maintenance of Soil and Water Resources." This criterion assesses the area and percentage of forest by activity type for risk to soil attributes, the change in forested catchment water yield characteristics through time, and the change in forested catchment river health characteristics through time.

**Topics:**

*"Remember the Millennium Drought? Well, so do our rivers…"* – Rachel Brown and Tim Peterson.

*"Climate risks and science-policy interface dilemmas in Australia's Murray Darling Basin"* – Jason Alexandra

Other topics to be confirmed closer to the date.

**About the Speakers:**

**Dr René Van der Sant**

René is a post-fire runoff and erosion processes specialist, who currently works with Melbourne Water managing forested water supply catchments. She has professional experience with forest and bushfire management, and has been involved in Bushfire Rapid Risk Assessment Teams over the past season. Her PhD research at the University of Melbourne focused on the effect of landscape aridity on post-fire hydrogeomorphic processes, and predicting runoff and erosion events in forested water catchments.

**Professor Patrick Lane**

Patrick is a Professor at the University of Melbourne's School of Ecosystem and Forest Science. His research examines the effect of forest growth dynamics and disturbances such as fire on the amount and quality of water from forested catchments.

**Mr Jason Alexandra**

Jason is a farmer, consultant and researcher. He has held senior roles in national and international organisations including the Murray Darling Basin Authority where his responsibilities included climate science and riverine ecosystem management. He has coordinated national R&D programs on climate, water, vegetation and biodiversity and initiated the citizen science program ClimateWatch. He is currently undertaking research on climate change and water governance. As Managing Director of Alexandra & Associates, Jason has completed over 120 research and consulting projects focused on sustainability and natural resources. Most of his papers and reports are available at https://rmit.academia.edu/JasonAlexandra.

**Dr Tim Peterson**

Tim is a research fellow in the Department of Infrastructure Engineering at the University of Melbourne. His research focus is on making better use of existing hydrological data for public-good outcomes, including to understand long-term catchment dynamics and to challenge existing assumptions within hydrology. After a BEnvEng and BSc (Monash), and professional experience at SKM Consulting, he completed a PhD in hydrological resilience at the University of Melbourne (2009). Since 2010 he has held an ARC Post-Doctoral Fellowship, led multiple industry funded projects, been a chief investigator on multiple ARC Linkage projects with DELWP and taught the core Environmental Engineering Masters subject "Quantitative Environmental Modelling" (2010-2017) at the University of Melbourne.

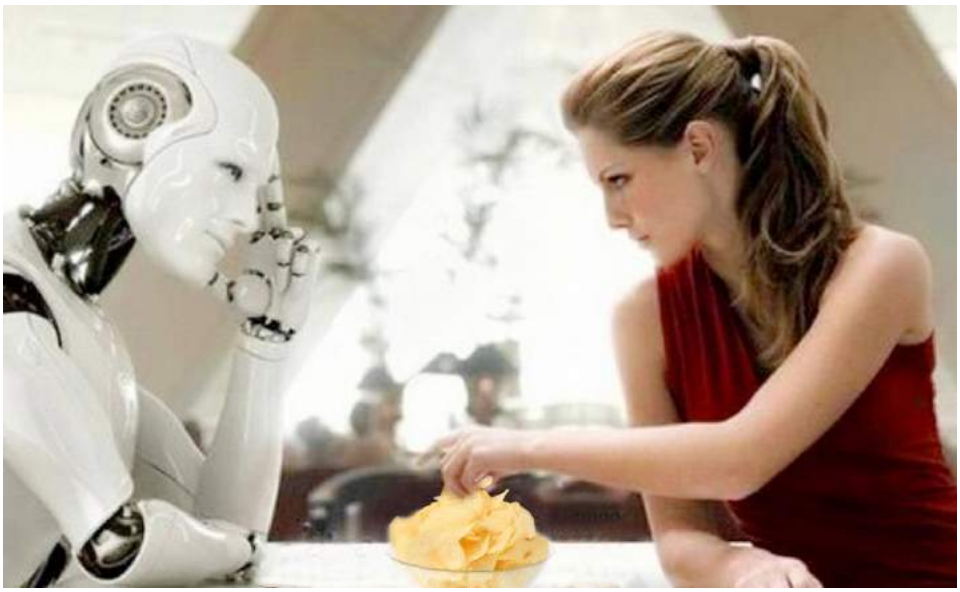
**Ms Rachel Brown**

Rachel is a Senior Project Officer in the Hydrology and Climate Science Team within DELWP's Water and Catchments Group. The team coordinates the Victorian Water and Climate Initiative, which supports research into the impact of climate change and climate variability on Victoria's water resources. This includes three distinct but related research projects being undertaken by the University of Melbourne, CSIRO and the Bureau of Meteorology. Rachel's role includes close interactions with the researchers and as a knowledge broker to help share the scientific outcomes with the water sector through practical advice and guidance.

**Places limited, bookings essential! Register online** now at https://rsv.org.au/events/forests-soil-water/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

## Social Work: Collaborative Human-Robot Interaction

**Thursday, 25th July at 7:00pm**



**Speaker: Professor Elizabeth A. Croft**
**Dean of Engineering, Monash University**

*A joint presentation with the **Australian Academy of Technology & Engineering***

Over the last decade, there has been a significant investment in humanoid and human-friendly robotics platforms. New safety standards have been developed, aimed at human-robot collaboration. In certain areas, robots have successfully entered our lives, vacuuming our floors and cutting our lawns. Yet in other areas, human-robot collaboration has not yet hit the mark, and social interaction has been identified as one of the ten "Science Robotics Grand Challenges".

Join Professor Elizabeth Croft to discuss the development of human-robot interaction methods that will permit shared understanding of tasks, intentions, and responsibilities necessary for working and living together with robots.

### *About the speaker:*

**Professor Elizabeth A. Croft** is the Dean of Engineering at Monash University and Professor in the Departments of Mechanical and Aerospace Engineering, and Electrical and Computer Systems Engineering. Her research in industrial robotics and human-robot interaction advances the design of intelligent controllers and interaction methods that underpin how people and autonomous collaborative systems can work together in a safe, predictable, and helpful manner.

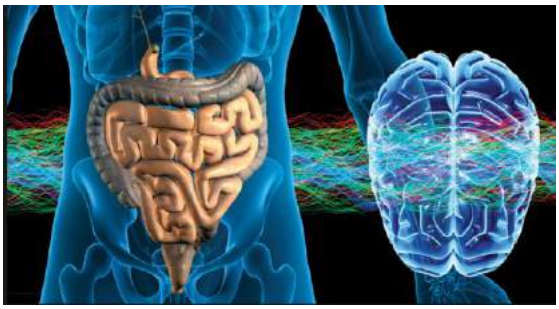
She held the Natural Science and Engineering Research Council of Canada Chair for Women in Science and Engineering (BC/Yukon) from 2010-2015 and the Marshall Bauder Professorship in Engineering Economics, Business and Management Training from 2015-2017. Her recognitions include a Peter Wall Early Career Scholar award, an NSERC Accelerator award, WXN's top 100 most powerful women in Canada and the RA McLachlan Award for Professional Engineering in the Province of British Columbia. She is a Fellow of Engineers Australia, the Canadian Academy of Engineers, Engineers Canada and the American Society of Mechanical Engineers.

**Places limited, bookings essential!** *Cocktail function from 6:00pm.* **Register online** now at https://rsv.org.au/events/human-robot/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, or entering their **promotional code** in the online ticketing window.

# Mind over Faecal Matter: Gut Biome and Mental Health

**Thursday, 8th August at 7:00pm**

**Speakers:**



## Associate Professor Elisa Hill-Yardin

**ARC Future Fellow & Vice-Chancellor's Senior Research Fellow, School of Health & Biomedical Sciences, RMIT University**

## Associate Professor Ashley Franks

**Director of Research, School of Life Sciences and Leader of Franks Lab for Applied and Environmental Microbiology, La Trobe University**

*Spoiler: we really do have gut feelings.*

Food is something we find ourselves always thinking about and there's a good reason for that. We have a 'second brain' in our gut that regulates the digestion and movement of our food from one end of the gastrointestinal tract to the other. Our gut brain and main brain are connected and influence mood, behaviour and mental health.

Our gut is home to trillions of microbes, making up one third of faeces. Over the last decade, scientists have realised that most of these bacteria are beneficial to both our brain and our gut, and without them our guts don't function properly.

People with autism often suffer from gut problems, but nobody has known why. Our speakers' work has discovered the same gene mutations – found both in the brain and the gut – could be the cause. These gene mutations cause changes in how the gut works as well as changing the balance of the bacteria in the gut. Different gut bacteria in turn alter gut function and worsen gut health via a detrimental feedback loop.

Join Associate Professors Elisa Hill-Yardin and Ashley Franks, who will discuss how changing the way neurons communicate in the brain can alter the gut and the microbial communities we need for health. They will explore how combining neuroscience, microbiology and advanced genetics allows us to provide a holistic view of the gut-brain axis, how it becomes unbalanced and how we can engineer changes to ease dysbiosis and gut dysfunction.

***About the speakers:***

**Associate Professor Elisa Hill-Yardin** is an ARC Future Fellow and Vice Chancellor's Senior Research Fellow at RMIT University. She leads the Gut-Brain Axis laboratory in researching how the nervous system interacts with microbes in health and disease including in autism-associated gut dysfunction. Dr Hill-Yardin regularly communicates research to the public including via mainstream media. She is a founding member and Chair of Frontiers in Neurodevelopmental Disorders (FiND), which enables leading international researchers to engage with scientists, clinicians and families.

**Associate Professor Ashley Franks** is the Director of Research for La Trobe University's School of Life Sciences, where he has established the Franks Lab for Applied and Environmental Microbiology, investigating microbial community structure and functions at interfaces. Together with colleagues and students, he has active research projects looking at the interactions of mixed microbial communities with plants, soils, microbiome, electrodes, sewer systems and submarines. For his research he has received a number of awards and funding from national and international sources.

**Places limited, bookings essential!** *Cocktail function from 6:00pm.* **Register online** now at https://rsv.org.au/events/mind-over-faecal-matter/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au. Fully subscribed **RSV Members** can access discounted tickets by registering via their online profile, or entering their **promotional code** in the online ticketing window.

# Science at the Extreme

## Friday, 9th August at 7:00pm

### Join us for the 2019 Victorian public launch of National Science Week at the Melbourne Museum

**National Science Week** is a collection of events, large and small, staged by individuals and organisations that, when taken together, make up one of Australia's largest festivals.

Science has always been about exploration, discovering and expanding our understanding of the nature of things. Every day, scientists in the field balance the excitement and danger of collecting data from some of the wildest and most hostile environments on the planet in the pursuit of knowledge.

From the frozen tundra of Antarctica to the deserts of central Australia, from the lava flows of Hawai'i to the depths of the world's deepest abyss off the Eastern coast of our continent, we're bringing together a dream team of science adventurers to share their journeys and discoveries.

This very special night will bring to you a panel of incredible speakers exploring **Science at the Extreme**, after which you can see the science galleries, talk to research scientists from Museums Victoria and enjoy a drink to celebrate the launch of this incredible celebration of all things science!

**Speakers:**

**Dr. Darlene Lim** is a geobiologist based at the **NASA Ames Research Center** in California. She has spent 25 years conducting field research around the world, in both the Arctic and Antarctic, as well as in underwater environments where she has piloted submersibles as a scientist and explorer. Currently, Darlene leads several NASA-funded research programs that are focused on blending field science research with the development of capabilities and concepts for future human spaceflight into deep space and Mars. She is the Principal Investigator of the NASA-funded SUBSEA, BASALT and Pavilion Lake research programs, and the Deputy PI of the NASA FINESSE research program. Darlene is a passionate promoter of science and exploration education and outreach efforts, and founded the Haven House Family Shelter STEM Explorers' Speakers Series, which from 2012-2015 enabled NASA and academic

researchers to conduct educational sessions with homeless children in the San Francisco Bay Area.

**Dr Kate Selway** is an Earth scientist who is passionate about understanding how our amazing planet works. She has led research teams in the deserts of central Australia, the savannas of East Africa, and the frozen expanses of the Greenland and Antarctic ice sheets. Like a doctor taking an x-ray, Kate makes measurements on the Earth's surface to peer deep inside it. She runs mathematical models of her data to understand why plate tectonics happens, and improve measurements of ice loss from ice sheets. Kate was awarded her PhD from the University of Adelaide in 2007, where she continued working in research positions, including an ARC Postdoctoral Fellowship, until 2012. She then worked abroad in postdoctoral research positions at Yale University (2012-2013), Columbia University (2013-2015) and the University of Oslo (2015-2016). In 2017 Kate returned to Australia to commence an ARC Future Fellowship at **Macquarie University**.

**Dr Dianne Bray** is an ichthyologist and Senior Curator of Vertebrate Zoology at **Museums Victoria**. Her job involves managing and developing natural history collections (mostly fishes and scientific artworks) so that people – including those not yet born – can answer all sorts of questions about our biodiversity now and into the future. Dianne joined the Museum's team aboard CSIRO's *RV Investigator* in 2017 to map the structure of the seafloor and collect samples of bizarre, deep sea creatures never before seen, contributing to our knowledge of abyssal biodiversity, including food webs, population connectivity, and evolutionary history, and help us understand potential changes caused by human activities.

**Nate Byrne (MC)** is a meteorologist and weather presenter on **ABC News Breakfast**. Prior to this, Nate spent 12 years working as a meteorologist and oceanographer in the Royal Australian Navy, and achieved a Master of Science Communication (Outreach) with the ANU and Questacon. A scholar of the Shell Questacon Science Circus, Nate toured the country delivering science shows to outback communities across Australia.

national science week 2019

**National Science Week** is presented under the **Inspiring Victoria** program by the **Victorian Coordinating Committee**, managed by the **Royal Society of Victoria**. **Dr Darlene Lim** is appearing in Victoria thanks to the generous sponsorship of **GHD** and **GHD Digital**.

**Places limited, bookings essential! Register online** now at https://museumsvictoria.com.au/melbournemuseum/whats-on/national-science-week-public-launch-science-at-the-extreme/tickets/.

## Major Event - Saturday, 10th August from 6:00pm


*See, hear, smell, taste, feel, more at this cornucopia for the senses.*

What are the possible futures of human perception? At this event combining performance, storytelling, and experimentation, make sense of the world of the senses, and find the limits to your own.


Augment your reality. AI, bionics and smart devices are here to extend and enhance your senses. See the unseen, and walk on the surface of a cell. Find your way with your fingers, and collaborate with an AI to create a musical masterpiece.

Tell a story about the patterns hidden in the night sky, and imagine what trees might have to say. Ponder the concept of common sense, and what animals can perceive that humans can't. Listen to the music of the elephants, the last moments of the Mars Rover, and the unfolding of the evolution of species.

Challenge your senses to work together, and become aware of senses such as kinaesthesia. Learn about how our senses mingle in synesthetic experiences, and sometimes fool us with hallucinations.

Can you maintain your appetite in the face of distinctly un-appetising pictures? Or avoid being tricked in our food sensory testing lab? Congratulate yourself with a drink from our bar, and discover why champagne is so bubblicious.

The world is full of new phenomena to explore, hiding just beyond the reach of your senses. So tune your ears, engage your nose, ready your tastebuds, and flex your fingers in preparation for an evening sure to be extra sensory, exploring the beautiful Parliament of Victoria.

***This event is recommended for a 16+ audience.***
Food and beverages will be available for purchase at the event.

*Extrasensory is presented under the **Inspiring Victoria** program by the **Victorian Coordinating Committee** for **National Science Week**, **The Royal Society of Victoria**, and the **Parliament of Victoria**. Bookings are available online at [https://inspiringvictoria.org.au/event/extrasensory/](https://inspiringvictoria.org.au/event/extrasensory/).*

# Stories from the Cosmos: What Indigenous Storytelling can Teach us about Memory

**Wednesday, 14th August at 6:00pm**

For over 65,000 years, the night's sky has served as a map for Indigenous peoples all around the world. Aboriginal Australians plotted the absence and presence of stars to develop celestial maps for navigation to survive the harsh Australian landscape. In doing so, Aboriginal Australians built complex knowledge systems using signals from the sky and the landscape to recall and pass on significant knowledge, cultural values and wisdom.

The oral tradition of dreaming and songlines are deeply tied to the Australian landscape and night's sky, and this form of communication has endured phenomenally with memories being passed down from generation to generation to safeguard an encyclopaedic memory of water holes, walking routes and thousands of species of plants and animals across Australia.

Cultures around the world have long grouped stars into familiar patterns. Curiously, many of these constellations are perceived in strikingly similar ways, despite the cultures being geographically and temporally separated. Could this have something to do with psychological pattern recognition? And can we use the same method to encode our own memories in the modern world?

***Speakers:***

***Dr Simon Cropper***
**Melbourne School of Psychological Sciences, University of Melbourne**

***Dr Lynne Kelly***
**Science Writer, Author of "The Memory Code" and "Memory Craft"**

***Ms Kat Clarke***
**Artist, Writer & Assistant Curator at the Australian Centre for the Moving Image**

***Associate Professor Duane Hamacher***
**Indigenous Astronomy & Science, School of Physics, University of Melbourne**

**Moderator: *Dr Meredith McKague***

A part of the 'PsychTalks' seminar series convened by the **Melbourne School of Psychological Sciences**, supported by the Royal Society of Victoria and sponsored by a grant from the Victorian National Science Week Coordinating Committee.

**Places limited, bookings essential! Register online** now at https://rsv.org.au/events/stories-from-cosmos/.

# Young Scientist Research Prizes – 2019 Competition & Prize Ceremony

**Thursday, 15th August at 6:30pm**

**To foster and recognise excellence in Victoria's early career scientists, the Royal Society of Victoria has established four prestigious competitive prizes open to Victorian students in their final year of doctoral candidature, in all areas of the Biomedical & Health Sciences, Biological Sciences (Non-human), Earth Sciences and Physical Sciences.**

Following assessment of applications across the four categories, eight finalists will be selected to present to our audience on the evening of 15 August, 2019.

Of the eight finalists, only four will win the first prize of $1,000 for their respective categories, with the runners-up receiving $500. The award is based on demonstration of the applicant's excellence in scientific research, ability to communicate scientific information clearly and succinctly to an audience of scientists and members of the general public on their particular research field and to answer questions from the audience.

Each of the short-listed candidates will be required to give a 15 minute oral presentation (10 minutes presentation, 5 minutes discussion) before a general audience of scientists and members at the Society. In addition to the merits of the methodology and significance of their scientific work, finalists will be judged on their ability to make their work accessible and interesting to an audience uninitiated in their field of endeavour.

Winners will be announced at a special function following the presentations at the Royal Society of Victoria's Hall.

The presentations are open to fellow students, friends and families through invitation, as well as RSV Members and the general public through this registration service.

*The Biological Sciences (Non-human) prize and Earth Sciences prize are generously supported by donations from the families of previous Royal Society Presidents: Edmund D Gill and Neil Archbold respectively. We also gratefully acknowledge the generous support of Dr S Max Richards AM and Mrs Margaret R Richards across all categories.*

**Places limited, bookings essential! Register online** now at https://rsv.org.au/events/ysrp-2019/, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

## Nominations for RSV Membership

Nominations for membership of the Society have been received on behalf of:

Miss Kate **ROWE**, Student, RMIT University
Mr Oskar **LINDENMAYER**, Geosciences Collection Manager, Museums Victoria
Mr Sina **KHATAMI MASHHADI**, PhD Student, The University of Melbourne
Mrs Hareem **KHAN**, PhD Student, RMIT University
Ms Stephanie **COWDERY**, PhD Student, Deakin University
Mr Jiadong **MAO**, PhD Student, The University of Melbourne
Mrs Elizabeth Hui Xin **THOMAS**, PhD Student, Monash University
Mr Pramod **SRIPADA**, PhD Student, Monash University
Ms Emily Jane **ROYCROFT**, PhD Student, The University of Melbourne
Miss Priyanga Dilini **TALAGALA**, PhD Student, Monash University
Ms Jessica **ROWLAND**, PhD Student, Deakin University
Mrs Tara Elizabeth **SCOTT**, PhD Student, Monash University
Mr Mithun **DAS**, PhD Student, La Trobe University
Ms Anne **AULSEBROOK**, PhD Student, The University of Melbourne
Ms Cassandra Jane **THOMSON**, PhD Student, Monash University
Mr Hossein **TAVASSOLI**, PhD Student, Swinburne University
Ms Simone Leah **STEVENSON**, PhD Student, Deakin University
Mr Michael James **ROAST**, PhD Student, Monash University
Miss Tram Thao Thanh **NGUYEN**, PhD Student, The University of Melbourne
Mr Christopher Barry **FREELANCE**, PhD Student, The University of Melbourne
Miss Annie Georgia **COX**, PhD Student, Monash University
Mrs Niveditha **VATHSANGAM**, PhD Student, The University of Melbourne
Dr Vinayak **SMITH**, PhD Student, Monash University
Mr Avinash Satish **GAIKWAD**, PhD Student, Monash University
Ms Shammi Akter **FERDOUSI**, PhD Student, Deakin University
Mr Bolong **ZHANG**, PhD Student, The University of Melbourne
Mr Jesse Taylor **BEASLEY**, PhD Student, The University of Melbourne
Mr Pawel **GLUZA**, PhD Student, The University of Melbourne
Dr Rachel **BRAND**, PhD Student, Swinburne University
Miss Elvina **PARLINDUNGAN**, PhD Student, RMIT University
Ms Avanthi Isaka **BADULLA LIYANAGE**, PhD Student, Monash University
Mr Bang Nguyen **TRAN**, PhD Student, The University of Melbourne
Mr Steven **EDWARDS**, PhD Student, Monash University

Unless Members request a ballot, these will be considered for election by Council and if elected, will be announced at the Ordinary Meeting of the Royal Society of Victoria to be held on 8th August 2019. Recently elected members who have not yet signed the Society's membership book are warmly invited to attend the 25th July meeting to be formally welcomed as members. **Please inform the office if you plan to attend, so we can prepare your membership certificate and welcome pack for collection.**

## From the President

Hi Everyone - as the famous saying goes,"so much to do, so little time." That is so true of the RSV program, RSV staff and the elected RSV Councillors.

We plan the year so that there is a little "spare time" (that's an oxymoron) for RSV staff regarding our regular July program as they plan National Science Week, which is managed by Dr. Renee Beale. For a program update please look to www.inspiringvictoria.org.au to see which programs you would like to enjoy.

**Can you help?** The education program **Principal For A Day** is looking for volunteers who would like to be a school Principal – with an interest in science - on **Tuesday 3 September.** I've been volunteering for 17

years in this exceptional program. Full information and registration details are available at www.acer.org/pfad. This is a wonderful opportunity to share your interest in science with schools around Victoria. If you'd like more information, please call me on 0418 346 9999 or email me at president@rsv.org.au.

## Call for Nominations: The RSV Medal for Excellence in Scientific Research 2019

In its Centenary year (1959) the Royal Society of Victoria instituted a Medal for Excellence in Scientific Research. The Award consists of a Silver Medal, awarded annually for scientific research in one of four categories that rotate from year to year.

Now in its sixtieth year, we are delighted to invite nominations for the **Royal Society of Victoria Medal for Excellence in Scientific Research 2019** in **Category III: Earth Sciences.** This category includes research in the disciplines of Geology, Geochemistry, Geochronology, Geophysics, Planetary Physics, Meteorology, Oceanography, Physical Geography, Palaeontology and related sciences.

The last recipient of the Medal in this category was **Professor David Karoly.**

The award of the Medal is based on demonstration of the candidate's excellence and leadership in scientific research. The candidate's research work shall have been carried out in Australia (including its territories), or on Australia, with preference for work done in Victoria, or on Victoria.

**Nominations close 31 July, 2019.**

**Enquiries: Chief Executive Officer, Telephone: (03) 9663 5259 or email rsv@rsv.org.au .** All guidelines on nominations and eligibility are available from https://rsv.org.au/awards-and-prizes/research-medal/

## National Science Week – August is Almost Here!


***Don't forget to register your event!***

For those already well on the way with organising events, please make sure you register your event on the national site at https://www.scienceweek.net.au/event-holder-registration/ .

Registering your event ensures that your event is officially counted as a National Science Week event, and we can support you with publicity or anything else you might need assistance with relating to your Science Week event. The more events registered, the more this helps us keep National Science Week running for the enjoyment of communities for many years to come.

Those running private events (not open to public audiences) are still encouraged to register their events – you can check a box that says "private event" when you register.

Any questions, please feel free to email me (details below). I'm here to help.

***Want to run a Science Week event, but unsure what to do?***

**Run a brain break morning tea** at your workplace. For more details and to register to receive the brain break pack (which includes resources and quiz questions) head to: https://www.scienceweek.net.au/brainbreak/

**Run a trivia evening** at your local pub or community centre. Keep an eye on the

National Science Week website, trivia kits will be released shortly.

**Check out the helpful booklet with event ideas for libraries at** https://www.scienceweek.net.au/wp-content/uploads/2019/01/Science-Week-Library-activities-ideas.pdf**,** and stay tuned for a new booklet coming soon with ideas for early childhood learning centres.

**Host a science film screening:**

- **Scinema** offer a community screening program during Science Week to support organisations and individuals to bring the best 2019 science films and documentaries to their communities. For more details visit: https://scinema.australiascience.tv/community_program/ .

- Coming to National Science Week for the first time in 2019, Film Outreach Australia is working with communities around Australia to screen the inspirational new feature film, **INVENTING TOMORROW,** across Australia. INVENTING TOMORROW follows the next generation of upcoming scientists from around the globe as they bring their revolutionary ideas to the World Science Fair. For more information about the program and to bring INVENTING TOMORROW to your community, follow the link: https://filmoutreach.com.au/national-science-week/ .

- **2040** is an innovative feature documentary that looks to the future, but is vitally important NOW. Award-winning director Damon Gameau (That Sugar Film) embarks on journey to explore what the future could look like by the year 2040 if we simply embraced the best solutions already available to us to improve our planet and shifted them rapidly into the mainstream. For more information about 2040, and to organise a screening for your community, visit: https://www.documentaryaustralia.com.au/films/4023/2040 .

## *Helpful resources for event holders*

Head to https://www.scienceweek.net.au/get-involved/organise-an-event/ for helpful guides on how to plan and run public events (including tips for producing media releases, evaluation sheets, and even links to download colouring sheets for children's events!).

For schools, the **Destination Moon: More Missions, More Science resource pack and poster** produced by ASTA contains fantastic ideas and activities for the classroom and beyond. Download these resources from https://www.scienceweek.net.au/schools/ .

A range of National Science Week **logos** and **science characters** can be downloaded from https://www.scienceweek.net.au/get-involved/graphics-logos/ .

**Questions?**

I'm always up for a chat about events and how we can make science accessible for all Victorians through National Science Week, so please feel free to contact me via email.

- **Dr Renee Beale,** Victorian Science Week Lead, The Royal Society of Victoria renee.beale@rsv.org.au

## Call for Expressions of Interest – DELWP Scientific Reference Panel

The Department of Environment, Land, Water and Planning (DELWP) are seeking Expressions of Interest to join a new DELWP Scientific Reference Panel. The Panel will provide advice and support to the DELWP Science Leadership Group in the implementation of the DELWP Science Statement and related activities.

DELWP are looking for scientists who will collectively have skills or expertise across the following areas:

- Biodiversity conservation
- Forest and land management
- Water and catchment management
- Social science
- Climate change
- Spatial and data infrastructure.

They are particularly looking for scientists who are:

- recognised by their peers as leaders in their field
- well networked, and able to draw on outside scientific expertise to support the Panel as required
- able to effectively distil complex scientific information and communicate it effectively to a non-scientific audience.

To find out more about the Panel or to express an interest, please visit: https://www2.delwp.vic.gov.au/media-centre/media-releases/scientific-reference-panel-eoi

Further information, application forms and the Terms of Reference can be provided by contacting:

**Dr Kim W Lowe**
Director, Arthur Rylah Institute for Environmental Research
(03) 9450 8600 or by email at Kim.Lowe@delwp.vic.gov.au – please include Scientific Reference Panel in the subject line.

Closing date for applications is Close of Business on **Friday, 12 July 2019**.

## Call for Expressions of Interest – Trust for Nature Board

The Minister for Energy, Environment and Climate Change, the Hon. Lily D'Ambrosio MP, is seeking expressions of interest for ten trustee positions, including the chairperson, for the Trust for Nature (TFN) Board.

Five positions are available for two-year terms and five positions are available for four-year terms. The terms of appointment for all members are due to commence on 9 December 2019.

TFN is established under the *Victorian Conservation Trust Act 1972* and works with communities and private landholders in Victoria to permanently protect and enhance the diversity of our natural flora and fauna.

Applicants should have a demonstrated interest or expertise in one or more of the following areas:

- Environment and conservation
- Strategic planning
- Business and financial management
- Fundraising and philanthropy
- Law
- Aboriginal and cultural heritage
- Agribusiness
- Public administration and corporate governance

**Further information and applications:**

Applicants are required to apply online via the **Get on Board** website at https://www.getonboard.vic.gov.au (search under vacancies). Here you will find further information regarding the recruitment process, the positions and information on Trust for Nature.

**Expressions of Interest close COB Monday 22 July 2019.**

## Moon Dust

by **Priya Mohandoss MRSV**

July 20th marks the 50th Anniversary of the first landing of the Moon. Since then, we have learnt so much about Earth's natural satellite, yet there is still more to deliberate upon, such as its meteoroid-made moon dust. This substance, which spreads into the vacuum of space, has been around for over hundreds of millions of years as a result of small meteorites that crash into the Moon with great force, smashing lunar rocks and dirt into splinters, melting the sand into glass.

Being a combination of pulverized materials, silica and metals such as iron, it is extremely sharp without wind or water available to smoothen its texture, creating much havoc for astronauts since the early Apollo missions. It has caused a number of incidents in space such as scraping the gold coating from astronauts' sun visors and damaging spacesuits. Furthermore, as it is graphite-black in colour, it has caused the original white material of the spacesuit to become more opaque, causing the fabric to soak up instead of deflect sunlight. In due course, this has caused astronauts to endure sweltering conditions and in particularly dire consequences, has damaged their life support systems.

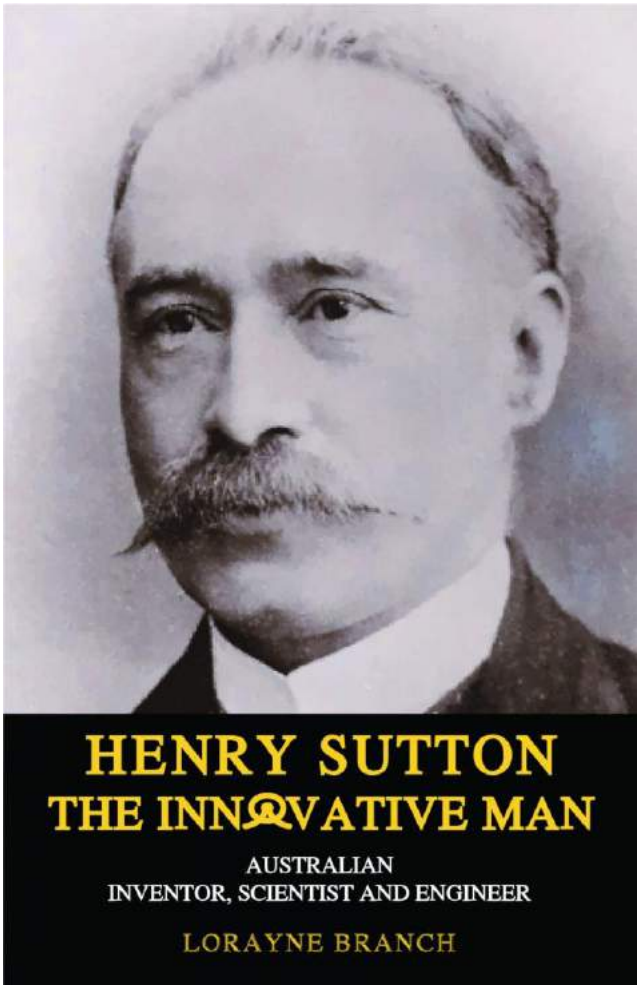
As with the smell of ash remnants or gunpowder in the air after a fireworks display, its tiny particles also have an effect on the lungs, especially the alveoli. In certain situations, some astronauts have claimed to also have suffered from 'lunar hay fever.'

However, this has only sparked more interest from international and commercial agencies, especially in the US, in conducting analyses and explore the complex challenges of Moon dust. Yet for now, those travelling to the Moon for space exploration will still have to take their chances in terms of contact with this dangerous form of cosmic debris.

## Life of the Innovative Man

by **Dr Douglas McCann MRSV**

**A review of *Henry Sutton: The Innovative Man: Australian Inventor, Scientist and Engineer* by Lorayne Branch**



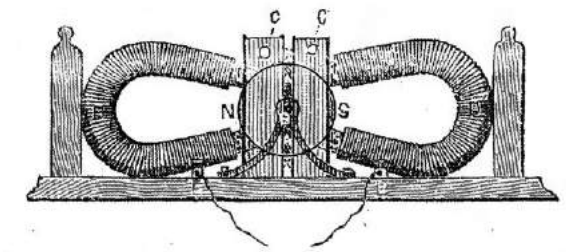

The Australian inventor Henry Sutton was by any account an outstanding achiever and a prolific innovator. He was certainly on a par with many of the greatest modern inventors, but few people have ever heard of him or have any knowledge of his contributions. The recent release in December 2018 of the book *Henry Sutton The Innovative Man: Australian Inventor, Scientist and Engineer* detailing his life and accomplishments is thus a long overdue study of a noteworthy figure in the history of science - not just in the history of

Australian science, but international science generally.

The author Lorayne Branch is Henry Sutton's great-granddaughter and the book is the culmination of ten years of research in which she travelled Australia and overseas to source little-known and long forgotten references and publications. In late 2013 she moved from her home in Brisbane to Ballarat, Henry Sutton's home town, so that she could immerse herself into the local community and gain a greater appreciation of the city, and the historical milieu of Sutton's roots. Of course, because the author is Sutton's great-granddaughter the book is more than merely an impersonal technical history, but a labour of love, and partly a family history as well … although that aspect is generally kept in perspective. The book is almost 400 pages and contains an appendix of over 100 pages that gives particulars of Sutton's patents as well as detailed endnotes containing reproductions of relevant papers, letters, journal and newspaper articles, and a bibliography of archival sources. The result is a stunning and almost unbelievable catalogue of achievements by this largely unknown and unappreciated inventor.

The book contains sixteen chapters which cover Sutton's life from his birth at Ballarat in 1855 during the height of the gold rush to his untimely death at Malvern in 1912. The chapters explicate the large range of technical areas in which Sutton laboured and mastered. He was a committed and apparently near-obsessive worker, and packed in a wide variety of activities into his lifetime despite his relatively early death at age 56. He was an intuitive designer and a gifted engineer and constructed original or improved designs of a large number of machines and scientific devices. The period when Sutton grew up, in the late 19th century, was a prime time for inventors such as Thomas Edison, Nikola Tesla and Alexander Graham Bell and for the introduction of new technologies. The earlier industrial revolution had provided the impetus and inspiration for the transformation of traditional society and the introduction of new scientific ideas, technologies and engineering practices. The introduction of electric power generation and the telegraph in particular led to a revolution in communication, industry, employment and recreation. Although relatively isolated in Australia Henry Sutton was also a major innovator of the period and befriended both Tesla and Bell. Some of the domains in which Sutton contributed include: aviation, battery storage, telephony, lighting, photography, printing, bicycle and car design and manufacture, wireless telegraphy or radio … plus a number of other technologies.

Henry's parents Richard and Mary Sutton founded a music business in 1854 in a tent on Bakery Hill on the Ballarat goldfields, which later became the well-known Sutton's Music Store in Sturt Street. Henry was born the following year. Initially he was home educated by his mother, and at 10 years of age he began to study the flight of birds and insects. He carried out some experiments, recording the flutter of insect wings against smoked glass, and by age 14 had developed his own theory of flight. In 1870 he built a manoeuvrable model 'ornithopter' which could fly in a circumference of 12 feet. These experiments with heavier-than-air materials for flight are regarded as the first to be carried out in Australia. Later, in 1878, two of his papers on flight were published by the Aeronautical Society of Great Britain. Henry, alongside his siblings, worked in the music store but his main interest was science and engineering. He is reputed to have read all the scientific books in the Ballarat Mechanics' Institute by the time he was 14.



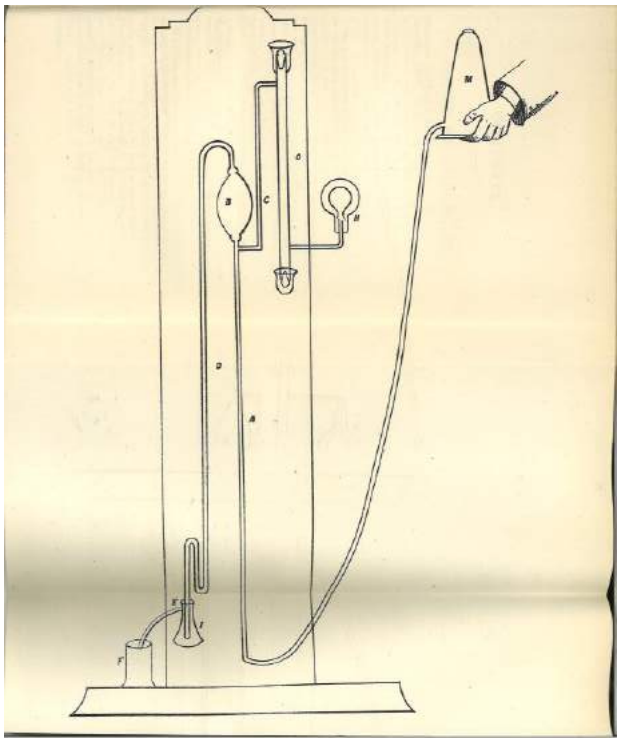

**Henry Sutton Continous Current Dynamo Diagram**

An analogous story to the development of the model ornithopter is repeated many times by the author when she describes the development by Henry Sutton of a plethora of other machines and devices. For example, also in 1870, he developed an electric

continuous current dynamo with a practical ring armature which was comparable to a later version by Belgian inventor Z. T. Gramme using similar principles as Sutton. There were a large number of parallel developments going on during this period. Alexander Graham Bell was issued his patent for the telephone on 7 March 1876 and after reading a brief account in *Scientific American* within six months Sutton had developed over 20 different versions. Although Sutton did not patent his own versions, 16 of these designs were subsequently patented by others. In 1878 he invented the first telephone handset. Sutton and Bell began corresponding and in 1910 Bell visited Sutton in Australia during a world tour. He was escorted to Ballarat by Sutton, where they exchanged ideas and examined Sutton's sophisticated telephone system networked around the building at the Sutton family's music store.

Although he designed and constructed a large number of original or modified devices Sutton only took out a limited number of patents, in fact, only about 35 in all. That figure includes concurrent patents taken out in different countries. In general Sutton altruistically believed in offering the fruits of his scientific research to the world. In some cases he took out a patent but never tried to protect it or financially benefit from it. In other cases, such his new colour printing process, he did attempt to get them on the local and London markets but with limited commercial success. He was primarily a researcher, innovator and inventor, not an entrepreneur.

Papers on two of Sutton's most internationally acclaimed inventions were published in the 1881 *Transactions of the Royal Society of Victoria* (issued in 1882). The first paper was titled 'On a New Form of Secondary Cell for Electrical Storage'. In 1880, Robert Ellery, the Government Astronomer and the President of the Royal Society of Victoria, wrote to Sutton and asked if he was able to devise an improved battery for the Victorian Torpedo Corps. In August 1881 Sutton demonstrated a new battery to Ellery who immediately recognised it as a significant step forward in battery design. Sutton was urged to protect and patent the invention although his initial preference was to offer the design free to the world. It was decided to publish two versions of the paper on the battery. One was sent to the Royal Society of London and the other was kept under wraps to be read at the Royal Society of Victoria following the London reading. As it turned out the Victorian reading took place on 9th December 1881 and the London reading a few days later on 15th December. Sutton's battery was exhibited at the 1882 Crystal Palace Electrical Exhibition in London and it brought him world acclaim. Thomas Edison acknowledged it as the world's best battery at that time. Ironically there was some negative feedback from some Ballarat citizens who thought that Ellery and the Royal Society of Victoria, out of jealousy, were not giving due recognition to Sutton's achievement, but it was more in deference to the Royal Society of London that publication and celebration of his invention was slightly delayed. Also, in science and technology, often it is only well informed contemporaries or colleagues who can accurately appreciate or understand another scientist's achievements. Nevertheless, as the author states, it does seem true that in the longer term Sutton was never locally accorded the recognition he achieved internationally and which he truly deserved.



The second paper published in the 1881 *Transactions of the Royal Society of Victoria*

was simply titled 'Description of Vacuum Apparatus' (the diagram from the paper is provided above). The paper was also published in '*The English Mechanic and World of Science*'. Sutton's mercury air pump created a near perfect vacuum. His invention was again a considerable improvement on existing technology and again he declined to patent it, preferring to give it to the world gratis for the benefit of all. Both Joseph Swan and Thomas Edison used the design in the production of their incandescent light globes. The vacuum pump was used in the medical field in hospitals in Britain and worldwide. It was still being used in hospitals long after Sutton's death in 1912. Incidentally, Sutton himself worked independently on carbon lamps or incandescent globes, and designed and built a light globe on 6 January 1880. This was shortly after Edison who had just filed a patent for an electric lamp with a carbon filament in November 1879. Robert Ellery later stated that Sutton had invented the light globe at the same time as Edison but due to his isolation received no credit for it. In 1883 Sutton joined the Royal Society of Victoria as a Country Member.

Probably Sutton's most celebrated invention was his development of the 'telephane' which was a forerunner to television. Sutton envisaged sending pictures by wire. One method he devised was sending still images by facsimile and the other idea was to transmit moving pictures. He is reputed to have successfully transmitted an imperfect but recognisable image along telegraph wires in 1885. Science historians credit Sutton with 'the first feasible television system'. He published a paper on 'tele-photography' in *Telegraphic Journal and Electrical Review* in 1890 and *Scientific American* in 1891. This paper was re-published by *Scientific American* two decades later, in 1910. Over a four year period, from 1890 to 1893, Sutton travelled to England, Europe and America to further his knowledge and meet with other inventors. In England he attempted to market his new *Suttontype* half-tone photographic printing process but with limited success. A highlight of his trip was his introduction to Nikola Tesla in 1992 by Lord Rayleigh and William Preece and his attendance at a lecture by Tesla at the London Institute of Engineers. Tesla and Sutton immediately hit it off and together they transmitted the first still image in England using Sutton's system. During their discussions Sutton conceived of the idea of transmitting pictures wirelessly and promptly started research on wireless telegraphy (or radio).


**A Sutton Voiturette Pedal Car, built in Ballarat, Victoria in 1900**

On his return to Australia Sutton went on to contribute to the foundation of the local motor industry. He invented a combustion engine and carburettor and built some of Australia's first automobiles. He was one of the founding members of the RACV and wrote the motion that officially founded the club in 1903. One of Sutton's cars, along with a combustion engine and a carburettor, were displayed in the Palace of Transportation at the St Louis World's Fair in 1904. Henry and his brothers also set up Sutton's Cycle Agency in 1895 and capitalised on a huge boom in cycling in the last years of the 19th Century.

In the early years of the 20th Century Sutton again gained world recognition with his work on wireless telegraphy or radio. He took out five patents relating to wireless telegraphy, and in 1908 he is reputed to have built the world's first portable radio. He built a large wireless station at his home in Malvern and installed an aerial 102 feet high and for a time held the world record for the longest single wireless transmission. Sutton gained the attention of the American Great White Fleet when it arrived in 1908 and some of his radio inventions were subsequently used by the Australian, American, British and Japanese navies.

Lorayne Branch has produced a book that spans a wide range of technologies in line with Henry Sutton's interests and has admirably succeeded in producing an absorbing technical and personal biography. The difficulty of accurately covering such a broad realm of inventions is obvious. There is little difficulty understanding that it took many years for the author to complete her task. Her devotion to her great-grandfather shines through, and possibly it needed that sort of commitment to produce such a book. A more detached researcher would probably have had trouble justifying spending the time necessary for such a thorough exposition. Despite the technical details the narrative is easy to follow.

**Henry Sutton's great-granddaughter, and biographer, Lorayne Branch.** *Photo: ABC*

Initially, for the reader who knows little about Henry Sutton, it might appear the author is exaggerating his achievements. At first the reader may get the feeling that the author is claiming that Sutton achieved a 'first' with almost everything he worked on. It almost appears as if there are too many of them for all of them to be true. Invention and innovation is intrinsically a ground-breaking exercise and a moveable feast and many inventors could claim or be credited with 'firsts' even with relatively minor variations. However, in Sutton's case, a number of his innovations were significant steps forward and genuinely novel and, moreover, there were a lot of them. After reading the book and thoroughly checking the research there is little for a critic to disagree with; Sutton was clearly a leading innovator of the period.

One can only imagine just what Sutton could have achieved if he was less isolated, more protective of his innovations and patents, more entrepreneurial, or had the right financial backing such as that which Tesla secured with the entrepreneur George Westinghouse. Lorayne Branch's advocacy is compelling; Henry Sutton is an unsung Australian inventor arguably on a par with Edison, Bell, Tesla and Marconi. Her extensively researched monograph goes a long way in delineating his achievements and placing them in a broader context. This is a book that would certainly inspire any young Australian inventor and it deserves a large audience. It could also be profitably read by anyone who is interested in scientific biography and the history of science and technology generally.

*Our thanks to Doug for a terrific review and insight into both Lorayne's work and the achievements of her amazing great-grandfather! Copies of* Henry Sutton: the Innovative Man *can be purchased online from Ballarat Heritage Services:*

*https://ballaratheritage.com.au/bookshop/henry-sutton-the-innovative-man/*

- ***Mike***

## From Past to Future: Stories of a Geoscientist

by **Catriona Nguyen-Robertson MRSV**

**Associate Professor Stephen Gallagher with Dr William Birch AM MRSV in the Ellery Theatre**

*This article follows a presentation at the Royal Society of Victoria on 27 June titled "From Monsoons to Desert: 50 Million Years of Australian Climate History," featuring palaeontologist Associate Professor* ***Stephen Gallagher*** *from the University of*

*Melbourne. This was the Society's annual joint meeting with the Geological Society of Australia (Victoria Division), styled as the Howitt Lecture in honour of one of Victoria's earliest and most accomplished "natural scientists", Alfred W. Howitt MRSV.*

**Members and guests gathered for the Howitt Lecture**

We gather clues about the future by looking back at the past.

Geoscientists read the past to inform the future changes in our climate and ocean, but geoscience in Australia is challenging. The harsh, arid, intense climate and extreme weather processes (such as cyclones) destroy much of the evidence on land – it's mostly pushed offshore. Dust from land and sediment from rivers are swept to the ocean floor, and these are our best records of the changes in Australia's climate over millions of years.

Associate Professor Stephen Gallagher has spent months at sea over the past several years, drilling into the past to obtain a record of Australian geological history. He first became fascinated with digging up the past as a twelve-year-old in Dublin, collecting fossils with friends – and he has been "drawn to collecting fossils all this time." Now, he works at the School of Earth Sciences at the University of Melbourne and is part of the International Ocean Discovery Program (IODP) as an invited scientist and leader on expeditions. During his studies, he has "shifted around the geological timeline," collecting samples that reveal clues into Earth's history.

According to Gallagher, "the best place to get archives is actually offshore." He recently spent two months on an expedition travelling around the north-west shelf of Australia. 125 people were on board the ship to drill core samples from the ocean floor at multiple locations along the coastline and prepare these for extensive analysis by a team of 30 scientists. The team was divided in two, working two 12 hour shifts each day, all week, only all coming together for meetings at the handover period between shifts. The drilling team recovered 5.25 km of samples, and tens of thousands of measurements were recorded for every millimetre of these before the expedition even reached land.

This diverse group of scientists measured the magnetic intensity, thermal conductivity, weight, etc. of the samples, but Gallagher was most interested in the microfossils present. The fossils of algae and critters like protozoa act as time indicators that help establish the age of each core segment. Although sometimes, rather than being helpful, critters can get in the way: they chew through some of the layers of sediment which mixes the layers, making it difficult to retrieve finer details; this means we get a picture of eras rather than annual cycles.

The expedition's first aim was to assess variability of the Indonesian Throughflow, an ocean current that passes through the

Indonesian archipelago and provides a pathway for warm water to move from the Pacific to the Indian Ocean. While the west coast of Australia would be colder and more arid due to its position relative to the Indian Ocean, the Indonesian Throughflow hits Indonesian islands, creating the re-directed south-flowing Leeuwin Current, similar to the East Australian Current on the other side of our continent (the strong, warm current as seen in *Finding Nemo*).


The Leeuwin Current has brought spectacular coral reefs much further south than they could otherwise grow. It also brings warm tropical water south, allowing Western Australians to have an early spring dip in the ocean - a unique feature of Australia, as most west coasts in the world are characterised by cold ocean temperatures. Even if you're not a keen swimmer, the currents are also to thank for bringing tropical marine species closer to home, contributing to our ability to dine locally on rock lobster. Over time, the coral reefs have come and gone, and Gallagher could map these changes to find "lost" or "drowned" reefs, and their effect on our continent.

The expedition set out to recover a 5-million-year record of the Australian climate – and surpassed their expectations by uncovering 50 million years. Gallagher was pleasantly surprised at the gems of information discovered on changes to aridity, sea levels, and monsoon cycles that the core samples revealed. The presence of oolites (spherical grains of sedimentary rock) is rare in the Indo-Pacific region, yet he found beautiful oolites that are indicative of periods of high aridity. There were also sections in the core that resembled dry land, as identified by dried crystals of water, signifying that there was a time that the sea levels had receded so much that the offshore location sampled had been connected to land. Most interestingly for Gallagher were the dry specks among wet clay sediments that revealed the annual variation and intensity of the monsoon and dry seasons. These findings can now be linked to our predictions of future climate and weather processes.

Five kilometres of seabed core acts as an historical archive, revealing stories of the Australian continent and its climate. An enormous amount of information can be unveiled from a single expedition such as this. As Gallagher puts it, they are "literally digging through [academic] papers". He and his team are advancing the scientific understanding of our planet's history, which will help inform our future.


**From left: Associate Professor Stephen Gallagher with Professor David Cantrill (Chair of GSAV, vote of thanks) and Dr Bill Birch (Immediate Past President, RSV).**

*Thanks again to Stephen for a wonderful presentation! Livestream footage of the 2019 Howitt Lecture is available from the Society's Facebook site at:*
*https://www.facebook.com/royalsocietyvictoria/videos/905834269773989/*

**Donations to the Royal Society of Victoria can be made at any time via the following methods:**

**Online**: we can accept gifts through credit card and PayPal transactions on our website at https://rsv.org.au/about-us/support/

**Via mail:** the form **below** can assist you in allocating your donation to your preferred activity area, using either your credit card details (Visa or Mastercard), a cheque/money order made out to the Royal Society of Victoria, or notification of a direct Electronic Funds Transfer (EFT) transaction to the Society's bank account.

**In person:** we can accept donations at the Society's office in cash, cheque/money order or via credit card.

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