



The Royal Society OF VICTORIA

Promoting science since 1854

PATRON: The Hon Linda Dessau AC
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This Month's Events...

9th August: Andrew Pask

"Secrets from Beyond Extinction: Unlocking the Thylacine Genome"

11th August: The Great Debate

"The Greatest Discovery Ever Made"

15^h August: Let's Torque & Sisters in Science

"The Future of Space Travel"

16th August: Young Scientist Research Prizes

18^h August: Larry Sherman

"You and your Racist Brain: the Neuroscience of Prejudice"

August 2018 Newsletter

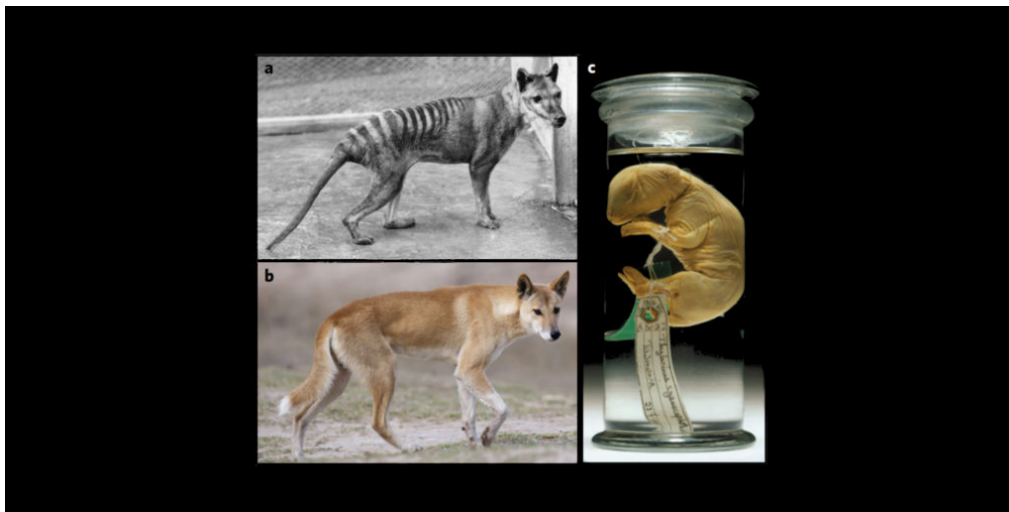
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rsv.org.au



Secrets from Beyond Extinction: Unlocking the Thylacine Genome

Thursday, 9th August 2018 at 7:00pm



Speaker: Associate Professor Andrew Pask

ARC Future Fellow, School of Biosciences, The University of Melbourne

The Tasmanian tiger or thylacine (*Thylacinus cynocephalus*) was the largest carnivorous Australian marsupial to exist into the modern era. Their resemblance to the eutherian wolf is considered the most striking example of convergent evolution in mammals. This is even more striking when you consider that they last shared a common ancestor over 160 million years ago.

Sadly, the last known thylacine died in captivity in 1936. However, Associate Professor Andrew Pask and his colleagues have sequenced the thylacine genome from a preserved “pouch young” specimen and used it to examine its phylogenetic placement, population life history and the genetic basis of its convergence with the wolf. Their findings have shed light on the biology of this unique, marsupial apex predator, and the mechanisms of its evolution, development and burden of disease.

About the Speaker:



Dr Andrew Pask is an Associate Professor and Reader and ARC Future Fellow in the School of BioSciences at the University of Melbourne. His research focuses on defining key genes directing phenotypic development in mammals. He sequenced the genome of the platypus, tammar wallaby, thylacine and most recently the dunnart. His work on the thylacine examined the biology of this unique extinct species. He currently establishing stem cells from marsupials to

understand more about totipotent and pluripotent states in mammals and to provide the reagents necessary for species conservation. His work in marsupials has greatly increased our understanding of the biology of our unique fauna and shed light on many critical developmental events across all mammals, including proving important insights into the aetiology of human reproductive diseases.

A National Science Week event, presented by the Royal Society of Victoria.



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

The Great Debate: The Greatest Discovery Ever Made

Saturday, 11th August 2018 from 3:30pm

We've all been there, having that age old argument, what's the bigger breakthrough: the existence of atoms or quantum mechanics; DNA or CRISPR; the wheel or sliced bread. Well, to celebrate National

Science Week, the **Science Nation** is going to answer this question once and for all. Join the fun and mayhem as the best, brightest and bravest science aficionados in the land do battle in tournament of wits and wittiness in order to find out: what is the Greatest Discovery Ever Made?



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

The Future of Space Travel

Wednesday, 15th August 2018 from 7:00pm



For National Science Week, **Let's Torque** and **Sisters in Science** are joining forces to deliver an exciting panel discussion on a topic that humans have puzzled over for centuries: space exploration. We'll be asking what humans are doing in space currently, why we're there, and what we might find. We'll ponder the

implications of humanity entering space and visiting other planets, and weigh up the pros and cons in an interactive dialogue.

We'll also discuss the importance of collaboration in space exploration, why diversity makes us more effective and how we can communicate across the globe to include everyone in the future of space travel.



Places limited, bookings essential! Register online now at <https://rsv.org.au/events/future-of-space-travel/>, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au

Young Scientist Research Prizes – 2018 Competition & Awards Ceremony

Thursday, 16th August 2018 from 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.

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 on 16th August 2018, commencing from 6:30 p.m. Winners will be announced at a special function in the Burke & Wills Room, following the presentations. Of the eight finalists, only four will win the prize of \$1,250 for their respective categories. 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.

Eventbrite

Places limited, bookings essential! Register online now at <https://rsv.org.au/events/ysrp-2018/>, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au

You and your Racist Brain: the Neuroscience of Prejudice

Saturday, 18th August 2018 from 6:00pm

In large part, racism stems from the human brain's tendency to engage in prejudice, a process that allows our brains to make judgments based on visual information in milliseconds. These preconceived opinions about other people are not based on reason or experience but on instinct — and they have a basis in neuroscience. But why does the brain do this? More importantly, can we use what we know about the neuroscience of prejudice to overcome this reaction, potentially developing methods to combat prejudice and end racism?



Join **Dr. Larry Sherman**, a Professor of Neuroscience at the Oregon Health & Science University, who will explain how our brains react to people who are "different" and explore possible ways to overcome the automatic prejudice that contributes to racism in our society.

A joint presentation with the **RMIT School of Health & Biomedical Sciences** for National Science Week.



Eventbrite

Places limited, bookings essential! Register online now at <https://rsv.org.au/events/you-and-your-racist-brain/>, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au

Proceedings of the Royal Society of Victoria

Volume 130, No. 1

The July 2018 edition of the Society's Proceedings is now available online, open access from CSIRO Publishing at <http://www.publish.csiro.au/RS>.



Papers include:

Woodland birds and rural towns: artificial clutch survival in fragmented Box-Ironbark forests

B. Meney, S. Cunningham, M.A. Weston and D.A. Whisson (Deakin University)



A paper from four colleagues based at Deakin University reports the results of a study addressing the decline of woodland birds throughout the agricultural landscapes of south-eastern Australia. The specific mechanisms driving these declines remain unclear.

Beau Meney, Mike Weston, Desley Whisson and the late Shaun Cunningham suggest that reproductive failure via heightened egg clutch depredation could contribute to these declines. Although site-scale habitat may influence the risk of clutch failure, larger-scale influences, such as whether a landscape contains a rural town or not ('landscape type'), may also play a role. This study monitored artificial open-cup nests deployed in three pairs of the two landscape types and: 1) indexed clutch survival and predator assemblage; and 2) determined if clutch survival was influenced by landscape type and/or local habitat characteristics.

High levels of clutch depredation were observed in both landscape types and for all landscapes, with no evidence to suggest that landscape type

or habitat characteristics influenced clutch survival or the time-to-first-predator visit. Predator assemblage also was consistent between landscape types. Generalist avian predators were the most common egg predators. Such egg predators may be ubiquitous throughout the fragmented Box-Ironbark woodlands of south-eastern Australia.

This study raises concern for the reproductive success of woodland birds in Box-Ironbark forests of Central Victoria. Box-Ironbark forest is of high conservation significance, with its component tree species providing year-round flowering, and thus food resources for many species of birds and animals. Many bird species, including the endangered Regent Honeyeater (*Anthochaera phrygia*), are more abundant in Box-Ironbark than elsewhere. However, these forests in Central Victoria have become highly fragmented and structurally degraded, due primarily to the history of gold exploration and habitat clearance in the region. The study suggests that a consequence of this may be a greater abundance and widespread distribution of generalist egg predators throughout the region.

The full paper is available online, open access from CSIRO Publishing at <http://www.publish.csiro.au/RS/RS18001>.

Using spatial technology to locate the view illustrated in Eugene von Guérard's painting of the Kosciuszko massif

George Hook (Federation University)



Mount Kosciusko, seen from the Victorian Border (Mount Hope Ranges), 1866. Oil on canvas, 108.2 x 153.3 cm. Melbourne: National Gallery of Victoria. Photograph © National Gallery of Victoria. (The name of the mount was originally spelt as Kosciuszko but was changed to Kosciuszko by the Geographical Names Board of New South Wales in 1997.) Magnified details

of the painting can be viewed at <https://www.ngv.vic.gov.au/explore/collection/work/5679/>.

The colonial artist Eugene von Guérard travelled extensively throughout south-eastern Australia, sketching thousands of views during his three-decade-long sojourn in Australia. His field drawings are renowned for their fidelity to nature and observational accuracy, but the validity of the latter claim depends on comparing drawings with the view at the sites where he sketched. The location of the view in some artworks, such as *Mount Kosciuszko, seen from the Victorian Border*, has eluded art historians and aficionados who have ventured into the field.

This article from George Hook at Federation University canvasses his extensive collation of clues from historical narratives, maps and surveying techniques to limit the search area for the vantage point where von Guérard sketched the view on which he based his painting of the Kosciuszko massif. Novel use of spatial technology utilising satellite imagery, Global Positioning System (GPS) and Shuttle Radar Topography Mission (SRTM) data, particularly digital elevation models, to locate the actual site is explored, and the topographical accuracy of his sketches evaluated when compared with photographs taken from close to the site. Finally, the potential value of using spatial technology in art history field work is discussed.

The use of applications based on satellite, GPS or SRTM data, such as *Google Earth*, *Memory-Map* and *PeakFinder*, to locate difficult-to-find, isolated sites of views illustrated in paintings of wilderness and alpine areas, as many of the views in von Guérard's paintings are, appears to be a novel approach for which no precedent has been found in the literature.

The potential for utilising this spatial technology, along with the other strategies described in this article, to find the vantage points of previously unlocated views that von Guérard sketched and then painted back in his studio, is fully realised in the research program that encompasses this study. This has involved locating isolated, undocumented sites in the Grampians of western Victoria and, elsewhere, finding previously undiscovered sites in more accessible locations by using these topographical tools in conjunction with geomorphological, geological and ecological clues recorded in the field sketches on which the artworks are based (Hook 2017). *PeakFinder*'s digital elevation model, in particular, proves to be

a highly useful tool for locating the sites of views illustrated in von Guérard's landscape paintings, and may find further application in the field of forensic cartography.

The full paper is available online, open access from CSIRO Publishing at <http://www.publish.csiro.au/RS/RS18002>.

Thanks to our authors and our Editor in Chief, Dr Bill Birch for a terrific edition. For those who have ordered hard copies, as the page number is low, we are holding off on printing until the second edition is out in December, when we will print the entirety of Volume 130 in a single print run.

Nominations for RSV Membership

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

Dr Ken **TREGONNING**, Retired
Miss Catriona **NGUYEN-ROBERTSON**, PhD Student, The University of Melbourne
Mrs Carmel Frances **DIXON**, Accommodation Owner and Operator/Caterer
Dr Richard William Wortley **LOVELL**, Retired

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 13th September 2018. Recently elected members who have not yet signed the Society's membership book are warmly invited to attend the 9th August meeting to be formally welcomed as members. **Please inform the office if you plan to attend, so we can prepare your membership certificate for collection.**

A number of established members have indicated they have never had an occasion to 'sign in' – again, please let us know at the office if you'd like to rectify the situation, and we'll make sure you get the opportunity!



We spent a stimulating afternoon with some fascinating people for our second Chapter meeting of the year on 19 July.

We heard from David Gooding on the Bureau of Meteorology's **Weather Observation Website**,

from Jack Nunn on the upcoming **Science for All** environmental DNA project, and from Libby Hillman on the fantastic work of the **Geography Teachers' Association of Victoria** in enabling learning communities with the toolkit for effective citizen science.



David Gooding, Strategic Analyst for the Bureau of Meteorology, presenting the Bureau's Weather Observation Website (<http://bom-wow.metoffice.gov.uk/>), a collaborative project with the UK Met Office to enable Australians to set up their own weather stations to share observations, information and photos with the meteorological community, contributing to a data-rich body of knowledge on local meteorological conditions.



Citizen Science Victoria
@CitSciOz_VIC

Following

The passionate Libby Hillman from [@GeographyVic](#) - a vibrant teachers' association enabling amazing things in learning communities, helping teachers to incorporate #GIS, #environmental science, #demographics & #citizenscience to the Australian curriculum.
[gtav.asn.au/professional-l ...](http://gtav.asn.au/professional-l...)



4:15 PM - 19 Jul 2018

6 Retweets 10 Likes

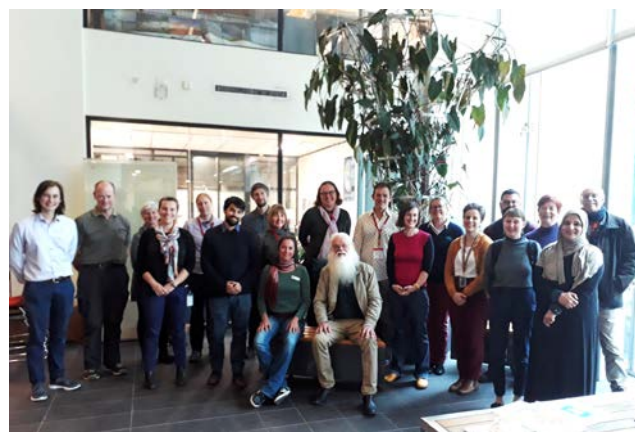


Citizen Science Victoria and Bureau of Meteorology, Australia

1 6 10

Workshops focused on the education sector and project alignment with learning communities; the social science of community engagement, including engagement metrics and tools; the recruitment and retention of citizen scientists in projects; and the consolidation and alignment of Victoria's citizen science programs and their outputs.

Thanks to everyone who came along or tuned in via webinar, and thanks to Linden Ashcroft and the Bureau for hosting us on the day. For those involved in citizen science programs and projects, you can send any info and news through to citscivic@citizensciencevictoria.org.au to inform an upcoming email newsletter. You should also consider nominating for a role on our coordinating committee for an upcoming election - we need committed people to fill a number of roles as we build the state's program. To keep informed, you can sign up to the mailing list; the signup form is available at <https://inspiringvictoria.org.au/programs/citizen-science/> or from the Citizen Science Victoria Facebook page at <https://www.facebook.com/CitSciVic/>.



Some of our group for the obligatory wrap photo!

Testosterone Rex: An Evening with Cordelia Fine

By **Catriona Nguyen-Robertson**
and **Scott Reddix**
RSV Science Communication
Officers

The article below follows a wonderful presentation to the Society on the evening of Thursday, 24th May 2018 from **Professor Cordelia Fine**, Professor of the History and Philosophy of Science at the University of Melbourne.

“Biological sex can capture our attention... we are spellbound by it; keep it constantly in the spotlight.” – Cordelia Fine, Testosterone Rex

Biological sex is one of the primary ways in which we divide the social world. When parents are expecting, one of the first things we want to know about their unborn child is whether it's a boy or girl. Sex is also one of the first characteristics we notice about the people we meet, and one of the traits we're least likely to forget.



Cordelia Fine (pictured left) is a professor in the History and Philosophy of Science at The University of Melbourne. After completing a Masters of Philosophy in Criminology at Cambridge University and a Doctor of Philosophy in Psychology at University College London, she became

interested in social cognition, neuroscience, and debunking the popular myths of sex differences. While biological sex often refers not only to two kinds of reproductive systems but also “two kinds of people”, Professor Fine believes that the distinction between XY males and XX females may not be as clear as people believe.



Professor Fine presenting to the RSV.

It has long been a popular perception that risk-taking and status-seeking have evolved as masculine traits, as there is less selective pressure for women to develop a “competitive edge” and to take risks. Professor Fine discussed the roles of men and women in society, particularly how their behaviour contributes towards “reproductive return” – their passing on genes to offspring and continuing their ancestral line. Scholars have previously reported on links between testosterone levels and risk-taking [i],

their argument being that where men evolved a promiscuous streak to be competitive in order to acquire or defend their status and sexual opportunities, the female strategy has been more focused on ensuring they have enough resources to care for their offspring. As Professor Fine points out, however, women can be risk-takers in their own right. Risks that women take may not be those typically classified as “higher-stakes adventure[s]” [ii], however the career sacrifice of taking on part-time work while caring for a family and speaking out about sexual assault, are among many other risks that may go unrecognised. In fact, when measured on an individual level rather than comparing genders on a larger scale, there is no significant difference in risk adversity between the two sexes [iii].



Professor Fine also challenged the assumption that testosterone is the sole determinant of behaviours that are considered aggressive and/or masculine. Professor Fine discussed numerous communities for which aggression and competition is observed between members without testosterone – namely females, castrated males [iv]. Furthermore, placing these members on hormone therapy also has little impact. A study of elite athletes, in which blood samples were collected within two hours of completing a major athletic competition and assessed for their levels of testosterone, revealed that 16.5% of male athletes had testosterone levels below the normal reference range[v], suggesting that testosterone doesn't make much of a difference. Moreover, there are differences between cultures around the world in the aggressive behaviours men and women display, therefore making testosterone less likely to be sole basis of so-called masculinity. Rather, the circumstances we find ourselves in and the ways we adapt to them play a large role in determining behaviour and

hormone production. Historically, the bulk of human behavioural endocrinology research has focused on a unidirectional relationship of hormones such as testosterone and oestrogen affecting behaviour, while the bidirectional influence and mutual reinforcement of one's own behaviour and other environmental influences on behaviour has previously been neglected [vi]. The endocrine system is a contributor to human behaviour and the decision-making process, but testosterone is merely another voice that chimes in.

Professor Fine argues that there are no characteristics that are strictly male or female. Testosterone may affect the brain, body, and behaviour to some extent, but it is by no means “the king nor the kingmaker”. Her prize-winning [book](#) signifies the end of “Testosterone Rex” – the idea that one hormone is the sole determinant of dominant behaviour and decision-making – which has reinforced an “unequal status quo” between men and women. Professor Fine encourages us to shift from this idea to apply a more scientific view – with the hope that people will examine evidence rather than blindly following ancestral beliefs.



RSV Vice President Nicola Williams with Professor Cordelia Fine and Science Program Chair Dr Kevin Orrman-Rossiter.

[i] Herbet, J 2015, *Testosterone: Sex, power and the will to win*, Oxford University Press, Oxford.

[ii] Alexander, RD 1979, *Darwinism and human affairs*, University of Washington Press, Seattle, quoted on p.241

[iii] Nelson, JA 2016, ‘Not-So-Strong Evidence for Gender Differences in Risk-Taking’, *Feminist Economics*, vol.22, no.2, pp.114-142.

[iv] Dixson, AF & Herbert, J 1977, ‘Testosterone, aggressive behaviour and dominance rank in captive adult male Talapoin monkeys’, *Physiology and Behaviour*, vol.18, no.3, pp. 539-543.

[v] Healy, ML, Gibney K, Pentecost C, Wheeler MJ, Sonksen PH 2014, ‘Endocrine profiles in 693 elite athletes in the postcompetition setting’, *Clinical Endocrinology*, vol.81, no.2, pp. 295-305.

[vi] van Anders, SM & Watson, NV 2006, ‘Social neuroendocrinology: Effects of social contexts and behaviours on sex steroids in humans’, *Human Nature*, vol.12, no.2, pp.212-237.

National Science Week Dispatch Centre – Thanks to our Volunteers



RSV
@RoyalSocietyVic

Incoming! Our RSV volunteers spent this afternoon packaging up [#ScienceWeek](#) posters, tshirts, jackets, umbrellas & more for dispatch to event holders across Victoria. Looking forward to a colourful [@Aus_ScienceWeek!](#)

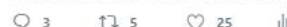


3:15 PM - 18 Jul 2018 from [Royal Society Of Victoria](#)

5 Retweets 25 Likes



You, Inspiring Australia and NationalScienceWeek



Huge thanks to those who came along to help us get Science Week materials on the road on 19 July, getting our event holders across Victoria “kitted up” and ready to be a part the national

effort. Many hands made light work of the packaging and logistics effort, and the couriers had a straight-forward job of it the next morning.



RSV members and friends with Science Week Lead, Dr Renee Beale

Brain Interfaces: the Hype and the Reality

The article below follows a most entertaining presentation to the Society on the evening of Thursday, 28th June 2018 from **Professor Arthur Lowery**, Director of the Monash Vision Group, as a joint lecture with the Victorian Division of the Australian Academy of Technology and Engineering (ATSE).

By Catriona Nguyen-Robertson

"Blindness is more feared by the public than any ailment with the exception of cancer and AIDS."
– William Dobelle, Artificial Vision Pioneer

Since the 1960s, people have been trying to stimulate the brain to restore vision. Many bionic vision devices involve replacing damaged photoreceptors with electrodes in the eye, however Professor Arthur Lowery bypasses the eye altogether and inputs signals for vision directly into the visual cortex of the brain to produce high-resolution images.

Professor Lowery has been obsessed with batteries and valves since he was four years old. He broke many of his father's drills, and built his first flashing light circuit at the age of seven (it still sits on his desk to this day). Today, he is an electrical and computer systems engineer leading the Monash Vision Group (MGV), an Australian Academy of Technology and Engineering (ATSE) fellow, and an Australian Research Council Laureate Fellow. His passion to strive in bionic vision science and technology may have stemmed from a young age, when he

invented a cookbook with built-in lights for his grandmother who loved cooking but was hard of seeing.



RSV
@RoyalSocietyVic

Wonderful hearing about Prof Arthur Lowery @MonashUni & his wayward Yorkshire youth, breaking into the treasures in the disused "science cupboard" at high school with his mates! Now an @atse_au fellow exploring the brain-machine interface & #bionic vision.



7:24 PM - 12 Jul 2018 from Melbourne, Victoria

6 Likes



You, Monash Science, Monash Engineering and Monash Medicine



6



Recently, there has been worldwide "hype" around brain interfaces and the seemingly endless possibilities that they provide. Despite bold predictions from several technology companies about the future of neural interfaces (e.g. Elon Musk's whole brain interface that allows the brain to connect to a cloud), the science of brain augmentation is still in its early days. There is a large gap between what is talked about amongst the hype and what is actually feasible in the near future. Professor Lowery gave us a reality check of what applications are possible for brain interfaces; electrodes can be placed to stimulate the occipital lobe for sight, the motor cortex for the control of prosthetics, or the speech centre for artificial speech. In addition, with bidirectional interfaces, it is possible to feed information into the sensory cortex to provide feedback as well as excitation signals. "Jump leads" can also be strung between different sections of the brain where connections may have been lost to bypass damaged areas (e.g. following stroke). There are multiple applications for this technology in the biomedical and engineering fields.

Great progress in artificial vision has been made since the earliest works of Brindley and Dobelle in the 1960s and 1970s, however there remained significant clinical, neurophysiological, and engineering challenges to producing commercially available bionic vision devices. Dobelle developed a brain implant that films the visual field in front of the user with a digital camera and transmits a signal to 68 platinum electrodes on the surface of the visual cortex, similar to “a Band-Aid patch on the brain”. Not all of the electrodes worked, but it allowed patients to see outlines of figures. The greatest issue with this system was that a large amount of power was required to send signals inside the brain given that the electrodes were on the surface and far away from their target neurons, and using a greater amount of power resulted in occasional epileptic episodes. In 2016, Second Sight Medical implanted the first retinal prosthesis system, which uses a camera to capture images that are transmitted as a series of electrical pulses to an array of electrodes implanted around the eye.



The Monash Vision Group (MGV) is a consortium of engineers and biomedical scientists, clinicians, and commercial companies led by Professor Lowery to develop bionic vision systems and build research capabilities in bionic vision science and technology. Since 2010, they have been developing the Gennaris bionic system, a wireless device designed to electrically stimulate neurons in the visual cortex. Tiles are placed around the visual cortex with electrodes penetrating 2mm into the surface, sending electrical input directly where the optic nerve would otherwise be sending signals. The benefit of penetrating electrodes is that, with a shorter travel distance, the electrodes require less power to transmit signals than the Dobelle model, also

reducing the chance of causing epilepsy. Albeit, there have been other challenges in the development of the bionic eye that the MGV has had to overcome. Our brains were not designed with a big fibre-optic cable for terabytes of information to be transmitted directly into them. To optimise the device and determine the best possible methods of manipulating our neurophysiology, Professor Lowery has looked to “clever students, computers and experiments”.



It is difficult to place a single point of connection in the brain and receive a large amount of information. The state-of-the-art electrodes used in the Gennaris device are orders of magnitude larger than neurons, and the more electrodes are implanted, the weaker the structural integrity of the entire neuron network becomes. The electrodes themselves can also cause damage to surrounding neurons during stimulation. The Gennaris device therefore only has 43 electrodes with pointed ends per tile to be implanted on the visual cortex for maximum stimulation and minimum damage (up to 11 tiles may be implanted). Another consideration in the placement of the electrodes are the laws of physics: due to the spread of currents, the current density decreases as it spreads out from electrodes to target neurons, and therefore more current is required (which brings us back to the epilepsy problem). To overcome this, materials with large effective surface areas are ideal for efficient stimulation. Carbon nanotubes are an attractive candidate due to their outstanding electrical, chemical and mechanical properties, higher surface area, and high conductivity. Additionally, due to their smaller size, the dendrites of neurons (sensory extensions that receive input) readily branch out to form connections with the nanopillars directly.

Gennaris comprises a miniature camera worn by the user on glasses, which can capture images and transmit them to the brain. The most useful features are extracted from high-resolution images using a number of processing techniques and converted to an electrical signal. The signal is transmitted to the implanted electrodes, which in turn, stimulate neurons in the primary visual cortex, evoking brief flashes of light, known as *phosphenes*, in the visual field of the user, which the brain interprets as images. A picture is thus formed from approximately 100,000 dots, or phosphenes, allowing for sufficient representation of the camera's field of view – and can even detect the emotions of faces using emoticon software.



Professor Arthur Lowery (centre) with RSV President David Zerman (left) and ATSE Victoria Chair Dr Alexander Gosling AM.

After overcoming the hurdles of physiology, bioengineering, and “18th century physicists and their laws”, Professor Lowery and his team have generated a bionic vision system that has been approved for clinical trials. By implanting electrodes directly within the visual cortex, the device bypasses damage to the eye and optic nerve, therefore addressing a large percentage of causes of incurable blindness with relatively high resolution.

“Wild DNA,” an Environmental DNA Citizen Science Project: a Pozible Fundraiser



Over the past year, our auspicee **Science for All** has been running regular ‘Campfires and Science’ events, involving local people in field research in the forests of the Central Highlands as an enjoyable ‘citizen science’ initiative. The group are currently preparing to train people to collect DNA samples from the environment (eDNA) to better understand which animals live there and help decision makers to determine how best to protect Victoria's biodiversity based on reliable data. You can see details at <https://scienceforall.world/>.

The group has limited funding and want to ensure the involvement of as many people as possible. They have begun work with schools and local communities across Victoria to find new facilitators and recruit participants. They need your help to run more community-focussed events - and to provide people with access to the technology they need to support good research. The Society is auspicing their fundraising efforts, and we encourage everyone with a passion for our unique biodiversity and the involvement of non-scientists in scientific work to support their “Wild DNA” campaign.

Please see the fundraiser details in the link below, and consider how you can support this fantastic “citizen science” initiative.

<https://www.pozible.com/project/campfires-and-science-wild-dna>

Pozible