

@Kin

FACING DISRUPTION

NATURAL < DESIGNER BABIES

MORBID OBESITY > SUGAR TAX

MORTAL
IMMORTALITY

FAITH
SCIENCE

VIOLATION > HORMONAL CASTRATION

NORMAL

BIOENHANCEMENT

+

FREE WILL & CONTROL
EUTHANASIA < PROLONGED SUFFERING

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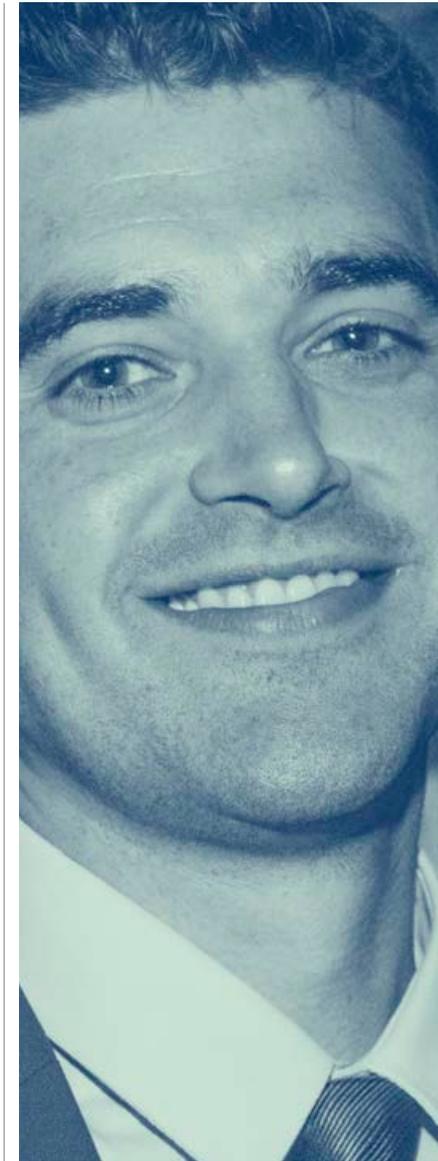
THE NEW
TERRORISM

ALL PLAY
ALL STARS

IT'S TIME TO
RETHINK ETHICS

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OR EXTINCTION

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Your connection with Deakin University does not end when you graduate. Our Alumni Community Program is designed to offer you meaningful lifelong engagement.

DISRUPT

It's a disruptive world. When we were at school, disruptive behaviour was punished; today disruption has most definitely become cool. It is the product of the convergence of social, mobile, analytics and cloud computing and it is increasingly the norm. Businesses that ride the tidal wave of disruptive change are steadily wiping out those that don't. New jobs are being created and others are being eliminated at a pace humanity has never seen before.

Today, we straddle two remarkably different worlds. On one side are hotels, taxi cabs, newspapers and the dog-eared 2010 Melways stuffed in your glove box. On the other side are Airbnb, Uber, Twitter and Google Maps. CEOs across the world are wondering whether they'll be the next to be Ubered or Amazoned. Dead companies do tell tales, with corporate graveyards littered with examples of companies such as Borders, Blockbuster, Blackberry, Nokia and Kodak that woke up to change too late.

Change is only disruptive if you didn't know about it ahead of time and it only occurs because an opportunity for change exists. Disruption comes when you fundamentally change a market, a business model, or a way of doing things and it's the combination of a series of innovations that together provide a credible alternative to an existing way of doing things.

The first Industrial Revolution used water and steam power to mechanise production. The second used electric power to create mass production. The third used electronics and information technology to automate production. We're now on the cusp of a fourth Industrial Revolution, with new and emerging technologies that combine the physical, digital and biological worlds. Virtual Reality that can transport you to new worlds or help you interact with information in new ways. Robots and software working together with humans. Nano-bots that will one day be injected into your blood stream to cure you of an illness. 3D printing that can create human organs and produce tools and products. Cognitive computers like Deakin's IBM Watson that give personalised answers to your questions. Big data that is revolutionising education, giving us new ways of thinking about information and new ways of linking data sets to generate insights about learning. We are witnessing the Internet of Everything, and it's changing how

people and things connect, how we collect and harness data, and how they all work together to enable intelligent processes.

The threats of disruption may be clear, but it is the opportunities that will always matter most. Deakin has harnessed the power, opportunity and reach of digital change in both its teaching and research and our success is reflected in a stellar rise in the international rankings. In 2016, Deakin ranked 214 in the prestigious Jiao Tong Academic Ranking of World Universities, rising by 182 positions to finish 3rd in Victoria and 11th in Australia. Deakin is now in the top two percent of the world's universities in each of the major international rankings.

This issue of dKin showcases a snapshot of Deakin's work in a disruptive world. It encompasses issues across autism, terrorism, global warming and ethics and it is an excellent read!

I do hope you enjoy dKin and that it will inspire you to keep in touch with us. 

Jane den Hollander
Vice-Chancellor





FEATURED: Greg Barton

Research Professor & Chair of Global Islamic Politics at Deakin Institute for Citizenship & Globalisation.

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R 0 R

GR3G B4RTON S34RCH3S FOR P4TT3RN5 OF 3XTR3MI5M
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HE MIGHT HAVE LOOKED LIKE JUST another 17-year-old kid growing up in the comfortable Melbourne suburb of Greenvale, but the Australian Federal Police had just discovered that the teenager, who can't be named for legal reasons, had been recruited by radical Islamic extremists to unleash murder and mayhem at the annual Mother's Day Classic fun run. At the time of his arrest – and the seizure of three home-made bombs

stuffed with shrapnel – the young man's bewildered parents told police that they were becoming concerned about the amount of time he was spending in his room, but had no idea what he had been up to.

Watching the drama unfold on the television, Deakin University's Professor Greg Barton, one of Australia's most prominent counter-terrorism researchers, found nothing about the parents' surprise surprising.

5 3 4 R C H I N G

PROF. BARTON HEADS UP THE Australian Intervention Support Hub, which develops evidence-based research that aims to understand the reasons or risk factors behind radicalisation and develop interventions that can help those at risk of being recruited and prevent a terrorist attack happening.

According to Prof. Barton, in recent years there has been a striking shift in how radical groups are recruiting.

Radical extremist groups like the Islamic State, he says, are becoming increasingly sophisticated in their use of social media to identify and recruit vulnerable young people who have previously displayed no radical tendencies.

'The Islamic State movement is essentially a more evolved version of al-Qaeda,' explains Prof. Barton. 'Islamic State has hundreds of slickly produced videos, tens of thousands of Facebook and other social media posts, and sophisticated online magazines like Dabiq produced to the highest standards and in multiple languages. They are using social media with flair and creativity to flush out people who might be receptive to their message and then get alongside them, grooming them in the name of friendship.'

'And as soon as somebody demonstrates a little bit of engagement, a bit of rapport, they invest expert attention in engaging with them and winning their confidence,' he says.

A year ago *The New York Times* reported on the shocking story of a young Sunday School teacher. Living in a remote area of Washington State with her grandparents, she was converted to Islam and became a supporter of Islamic State by an ISIS recruiter in England who had befriended her through chat room discussions.

Curiosity about an infamous video showing the gruesome execution of journalist James Foley led her to seek answers online. She started chatting to someone who took time to patiently answer her questions. He seemed warm and friendly and genuinely interested in her. In reality he was a cynical predator and was grooming her. He and his friends spent hours online with her, becoming her confidants, and eventually she completely trusted them and identified with them and their cause. In the process she converted to Islam but when she expressed interest in attending a local mosque to learn more they lobbied her to stay away from 'misguided Muslims' and listen only to them.

'There was nothing about her background to suggest vulnerability except that she was lonely and looking for friendship,' says Prof.

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SIMILAR TO THE R3CRUITM3N7
T3CHN1QU3S U53D 1N MULT1
LEV3L M4RK3TING OR TH3
M3MBERSHIP DR1V35 OF
NON-V10L3NT R3LIGION5'



Barton. 'It didn't start with her searching for religious ideas, but it ended up with her prepared to believe anything and ready to travel to Syria.'

Prof. Barton's research confirms that today's extremist recruiting techniques, such as those used by groups like ISIS, are less about religion and ideology and more about friendship and belonging.

'The methods used are similar to the recruitment techniques used in multi-level marketing or the membership drives of non-violent religions,' he says. 'A lovely couple turn up on your doorstep on a Saturday afternoon. You haven't got many friends; the kids aren't coming around as much anymore. You go along to the dinners and other events, and the community is really lovely – at a certain point you'll start to read the magazines they've left behind.'

'As you identify with your new friends you naturally begin to internalise their ideas. It won't be the slick magazine that convinces you, it will be their friendship. And it can happen quite quickly.'

The change in recruitment methodology has facilitated a change in how extremists are identified, as are the interventions used to prevent them committing harm – and that's where The Australian Intervention Support Hub comes into it.



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 NA7URALLY B3GIN
 TO IN7ERN4L1S3
 7H31R 1D34S.



'IN THE AREA OF 1515 7H15
D4T4-DR1V3N APPRO4CH 70
R3SE4RCH 15 4SSISTING
POLIC3 IN AR3AS WH3RE
TH3Y 4R3 CURR3N7LY
STRUGGLING TO R3SPOND
70 N3W P4773RNS OF
3XTR3MIST R3CRUITMEN7'

'Traditionally counter-terrorism has had a very tactical focus,' explains Prof. Barton. 'Police and agencies identify a person or a group, observe them for a while and then move in and arrest them to stop something bad from happening.'

Yet the Washington Sunday School teacher and the teens arrested in Greenvale had no long history of radicalisation, and could easily have fallen through the net but for the concerns of friends and family, who saw the social media posts and notified authorities.

Increasingly, explains Prof. Barton, combating violent extremism requires grass roots engagement. 'In the last 18 months there's been a real shift,' he explains. 'We are hearing more and more concerns from councils and community leaders about school age boys and girls becoming radicalised.'

Crucially, the police are working hard to build relationships within communities, creating a posse of people who will regularly meet with them and alert them to concerns.

'You might have, for example, an influential businessman who is happy to sit down with the police every so often because he's worried about his kids, and those in his broader ethnic or religious community, becoming radicalised.'

'These organic relationships are really, really key.'

Prof. Barton's team are currently studying data sets to identify patterns that might tell them more about the warning signs before they become obvious. In the era of ISIS this data-driven approach to research is assisting police in areas where they are currently struggling to respond to new patterns of extremist recruitment. 'It recognises that there needs to be a more organic and holistic approach,' he says.

While, generally, the police are intently across the details of particular cases, Prof. Barton's research analyses terrorism as a whole, to identify commonalities and possible intervention points.

'My work is trying to make sense of the patterns. We look at individual cases and we ask *what overall pattern is going on here?*

'We are in a position where we can look at the situation, not just in Melbourne or Sydney, but in the whole world, identifying the patterns.'

'The early work on radicalisation was identifying observable signs of behavioural change that suggest radicalisation and that resulted in a practical model, which is being rolled out by state police around the country.'

'Now what we're trying to do is take that work further.'

In Australia, says Prof. Barton, one particular emerging problem is what to do with people who have been stopped from travelling to Syria and Iraq.

'There have been AFP teams based in Melbourne and Sydney airports for 18 months now, that have prevented more than 700 people from travelling.'

'There have been over 200 cases where the evidence has been so overwhelming that they decided to cancel passports or not issue them.'

It's an important part of combating terrorism. If extremists travel to the Middle East, he says, there is a risk that some will eventually return home further radicalised – and trained to kill. And even whilst they remain with ISIS on the front line they will be reaching out to friends and contacts back home via social media and messaging apps, seeking to recruit others to join them or to launch attacks where they are. The boy in Greenvale, for example, had been recruited by a Melbourne-based ISIS activist who moved to Syria in late 2013.

'And the people who led the attacks in Paris on 13 November, 2015, had been to Syria in 2014 and come back with new skills.'

'Stopping people from travelling is important on many levels,' he says. 'The problem is, you stop them from travelling, well what do you do with them?'

'There may not be the evidence to charge them, but there is enough evidence to stop them from travelling, and so they are in this kind of limbo. They are left angry and frustrated and in a position where they might be persuaded to lash out in a violent attack, as was the case with Numan Haider in Endeavour Hills in September 2014.'

As new issues present, Prof. Barton and his team will examine the data. At the moment the biggest challenges come from the rise of ISIS but he doesn't consider the problem of violent extremism to be an inherently Islamic problem.

'Our work is agnostic,' he says. 'In an open democracy a person is absolutely entitled to hold strong views and have strong convictions. It is when they come to believe these justify violence that it becomes a problem.'

'It's not the beliefs or ideas that you have an issue with, it's the violent means.' 

Never stop discovering, never stop learning.

www.wtave.org
www.deakin.edu.au/adi

2014 GLOBAL TERRORISM INDEX RESULTS*

80% INCREASE
IN TERRORIST
ACTIVITY

The largest ever year-on-year increase in deaths from terrorism was recorded in 2014, rising from 18,111 in 2013 to 32,685. The number of people who have died from terrorist activity has increased nine-fold since the year 2000.

317% INCREASE
IN KILLINGS
BY BOKO HARAM

Deaths attributed to Boko Haram increased to 6,644. ISIL was responsible for 6,073 terrorist deaths.

120% INCREASE
IN COUNTRIES
WITH 500+ DEATHS

More countries than ever have high levels of terrorism. Countries suffering from more than 500 deaths increased by 120 per cent. In 2014, 11 countries had over 500 deaths while in 2013 only five did.

93 COUNTRIES
EXPERIENCED A
TERRORIST INCIDENT

A majority of countries did experience a terrorist incident of some kind, up from 88 in 2013.

*This GTI report refers to figures from 2014

@CAROLE_1995

THANK YOU. STUPID AUTOCORRECT.
I REALLY LIKE CHATTING WITH YOU

03.04.2016

02.24

@DAIFAA33

ME TOO. YOU'RE A NICE PERSON
WITH A BEAUTIFUL CHARACTER, IN
MANY WAYS UR MUCH BETTER THAN
MANY SO CALLED BORN MUSLIMS

03.04.2016

02.27

@CAROLE_1995

THANKS SO MUCH.
YOU'RE A REAL FRIEND

03.04.2016

02.27

@DAIFAA33

IF YOU NEED MONEY I CAN GET
SOME, DON'T BE SHY, JUST KEEP
IT QUIET. LET ME KNOW.

03.04.2016

02.28

@CAROLE_1995

OK. I'M GOING TO
SEND YOU MY ADDRESS

03.04.2016

02.40

ALL PLAY

SEASON IMPROVEMENTS

CONCENTRATION

27%
IMPR

ADAPTABILITY

16%
IMPR

SOCIAL SKILLS

20%
IMPR



MILESTONES

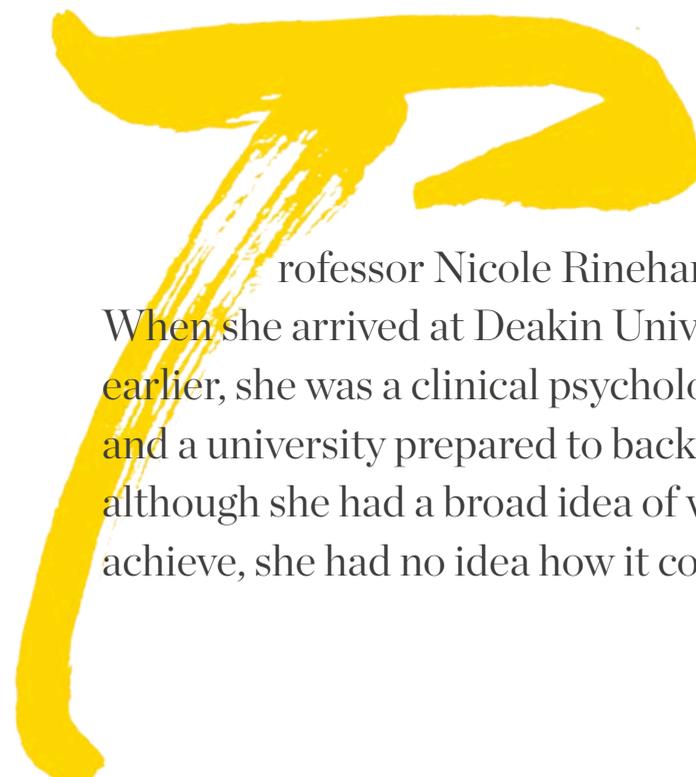
4 NEW FRIENDS

(MICHAEL, BECKY, JOHN & KAT)

IMPROVEMENT IN SELF ESTEEM

REDUCED BEHAVIOURAL CHALLENGES

ALL STARS



Professor Nicole Rinehart was frustrated. When she arrived at Deakin University, two years earlier, she was a clinical psychologist with a big idea and a university prepared to back it. The problem was, although she had a broad idea of what she wanted to achieve, she had no idea how it could be done.

*Figures opposite are based on some of the expected benefits of participation in Auskick based on past research on sports participation in children. A study on the specific benefits of Auskick participation is underway.

FEATURED: Nicole Rinehart

Director of the Deakin Child Centre & Director of Clinical and Community Partnerships at Deakin University.



OR ALMOST TWO DECADES PROFESSOR

Nicole Rinehart had been researching brain science and the assessment and treatment of neurological disorders. 'I was doing all this research and then on Fridays I would go to the clinic and see families with children with autism and Asperger's,' she remembers.

'Then one day it hit me: for all this research, very little was actually changing for the children and their families.'

The tragic fact is, Prof. Rinehart explains, it can take over a decade for research to be translated into practical interventions. What if, she wondered, she could devise a new platform within the community in which researchers and industry could come together and make a real difference in the lives of children who face developmental challenges?

There was simply nothing in the world on the scale of what she imagined. She knew a pathway had to exist, but here she was two years later, with the big idea yet to materialise.

'I was on the computer registering my son for Auskick,' she remembers, 'and I began to think, *what if my son had autism? What if he couldn't do this?*'

At that moment, Prof. Rinehart knew she had found her idea – sport could be the vehicle for change.

'Kids with autism and Asperger's who have been engaged in sports from an early age do so much better socially than those who for whatever reason haven't' says Prof. Rinehart.

'When you start to unpick it, sport is so powerful – it's important socially, it's a tool for communication, it's a rite of passage.

'If you are born with Asperger's and you are not good at communication and not good at games, but every lunchtime you're kicking a ball around the football field, you are accepted. There is kudos around sport.

'Also, for children who have developmental challenges, movement can make a huge difference. It can be very calming, and it can help them focus.

'Currently, there's this invisible barrier. There are many obstacles in the way for parents who are trying to get their kids involved in sports.'

Suddenly optimistic, she tapped out an email to the AFL, suggesting they get together to talk about how they might create something that would better support children, their families and coaches to facilitate greater participation for children with a developmental disorder on the sporting field.

The email worked its way up through the ranks of the AFL and landed in the inbox of the head of FIDA AFL, Logan Whitaker, who was



I was on the computer registering my son for Auskick, and I began to think, *what if my son had autism? What if he couldn't do this?*

charged with developing a program of AFL for people with an intellectual disability.

'When we spoke, we just went bang!' says Prof. Rinehart. 'We had exactly the same idea. I was coming from a research angle and he was doing it on the ground every day and we were both passionate! So I said, "let's take this mission on!"'

Prof. Rinehart explains that the plan had to be more than a sports program – it needed to be backed by solid research.

'The risk of putting a child with a disability into something and it going wrong can be devastating. It can really set a child back'.



'The AFL had already set up an *Autism Only* AFL Auskick Centre, so we decided to do a small pilot study,' she explains.

'What we discovered was that the kids loved it, and there was also a real improvement in motor skills.'

The study also showed an immediate knock-on effect to the dads' mental health, she says. 'In the clinic I always see mums, not dads – they are usually working.' On the weekends though, she explains, they are cheering from the sidelines with the other dads, they are actually participating in the child's therapy.

In November 2015, the Deakin Child Study Centre formally partnered with the AFL under a three-year research agreement to create the ALLPlay Sports Program.

Word soon got around about the proposed ground-breaking program, and Prof. Rinehart secured a meeting with Manny Stul, head of Moose Toys, an international company with an impressive philanthropic foundation. Six minutes into her pitch, Manny Stul agreed to totally fund the research.

With the AFL on board and funding in place, ALLPlay is now being rolled out.

'ALLPlay is evidence-based and community driven,' Prof. Rinehart says. And that is the game changer.

'The first year of the program is trying to

understand the issues through community driven research,' says Prof. Reinhart. 'We're doing a national survey, which will go to the community, coaches and kids that are engaged in AFL, as well as families who would like to be engaged but aren't.'

'Then next year we will develop the ALLPlay website. There will be information and resources for parents, as well as coach training. We're conceptualising it as a tool kit.'

'ALLPlay', says Prof. Rinehart, 'is a complete departure from the way children with developmental challenges have been treated. When a child has been diagnosed with autism the advice has always been to go and do a solitary sport. You can see why people do that, because people with autism often like to be alone and also it's easier.'

AFL football is the complete opposite. 'It's very different from tennis where there are rules and clean surfaces. When you play AFL it's muddy, it's cold, it's uncomfortable.'

'There's a lot of **reading** the play in AFL,' she adds. 'Kids with autism don't read the play socially, so if they can learn to read the play in sport, maybe it can effect reading the play in other areas.'

A key feature of the ALLPlay program is that the framework is able to be replicated across most sports. It can even be adapted especially for schools.



Kids with autism don't read the play socially, so if they can learn to read the play in sport, maybe it can effect reading the play in other areas.

For Prof. Rinehart, ALLPlay is the reason she came to Deakin. 'I could have gone on only doing research and publishing papers, but I wanted to actually do something that would deliver tangible outcomes for families now.'

'I think modern research leaders have to be able to move from a scientific panel to a community forum, to holding the hand of a parent, to the business world – and know the language and points of connection. The Deakin difference is that professors are given every opportunity to learn these different languages and come at research in a new way'.

'When I initially met with head of the School of Psychology Professor Greg Tooley, he did not skip a beat and immediately said, "brilliant idea, we back this 100 percent." When you work under leaders like this, amazing things start to happen.' 

Never stop discovering, never stop learning.
www.allplay.org.au





Every day, Professor Julian Savulescu tackles some of life's trickier questions.

FEATURED: Julian Savulescu

2015 Thinker in Residence,
School of Medicine,
Deakin University.



SHOULD

Should embryos be edited to create enhanced humans? Should we use genetic technology to grow organs in pigs that can be used in human transplants? And if so, at what stage does a human become a pig? Should we prolong or shorten a life of pain? And while we are at it, if administering a drug to convicted violent criminals will stop them reoffending, who would be against that?

PROFESSOR JULIAN SAVULESCU IS THE Uehiro Chair in Practical Ethics at the University of Oxford, and Resident Thinker at Deakin University. According to Prof. Savulescu, while ethics has long been considered an adjunct to progress in science and technology, it's rarely thought of as an answer in itself to any of the world's big problems, such as mass migration and bio-terrorism.

But, a serious rethink of our morals and ethics could quite literally save mankind and the planet, he says.

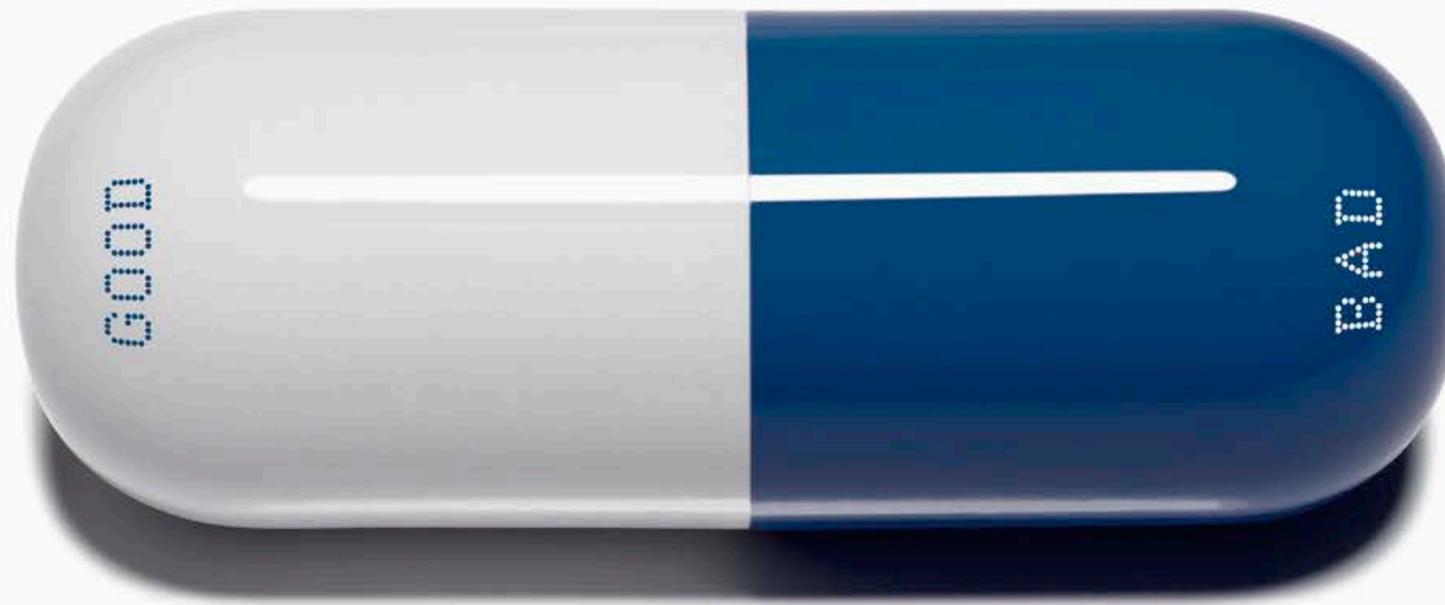
Thing is, we have to do it now. Prof. Savulescu points out that while technological advances have always thrown up ethical questions, an interesting thing happened around 40 years ago that was a game-changer: humans discovered a way to totally annihilate ourselves. 'Right now, in small scale

laboratories you can create polio,' he says. 'Within a decade you will be able to create very simple smallpox. If you create smallpox and release it into say 12 different places, you could wipe out a billion people before they even have time to react.'

'Now, there are around seven billion people on the planet, and we estimate one per cent are psychopaths, that's 70,000,000,' he continues. 'Then there are all the fanatics who aren't actually psychopaths. And it just takes one to decide to construct a biological weapon, and there's major disruption.'

'This is the most important issue we are facing today.'

'The problem is, we've reached a critical moment of technological advance and globalisation with very limited moral development,' says Prof. Savulescu.



'Religion and other forms of moral development were fit for purpose 1,000 years ago but are not fit for the sort of challenges we face today.'

According to Prof. Savulescu, it's not surprising that our ethical and moral development hasn't kept pace – it's never really had to.

'Humans are just accidents of evolution that have resulted from certain pressures and certain environments,' he explains. 'Nature designs us to live long enough to reproduce – that's it.'

'We are essentially biologically and psychologically the same as our hunter-gatherer ancestors. Hunter-gatherers travelled in groups of around 300. They evolved to live in groups, to care about their family and friends and their own tribe. They often had to compete with other tribes for resources and sometimes they would cooperate.'

'This is where our whole basic morality comes from.'

'But over the last 10,000 years we've seen the development of agriculture, urbanisation – massive changes to society. We now live in a globalised world.'

Prof. Savulescu says these early morals just don't work in today's environment. 'For example, people are still inherently xenophobic,' he says. 'They will identify members of other groups and treat them worse than themselves.'

'It worked well for a while because we were often competing with other groups and we needed to be distrustful of them.'

'All our morality was developed around those sorts of environments that aren't what we live in now.'

Prof. Savulescu adds that the pressures of globalisation and outdated, useless ethics have created a perfect storm.

'What we are seeing around the world and in Australia are people's xenophobic biases. Now you can overcome these. When you have a lot of wealth and a lot of cooperation between groups, people overcome them. But when people are under stress, those biases tend to dominate behaviour.'

'Unfortunately democracy makes it worse,' he says. 'You grant people freedoms and rights and you allow groups to exist with other groups with different ideologies. Tolerance and altruism are possible but they are very fragile things. They are not universal or easily evoked.'

'We need to rethink morality,' says Prof. Savulescu. 'What we should aspire to is a common morality that we can sign up to, that is inclusive of, but incorporates and transcends all social and religious groupings'. His ethics research has included projects on bioenhancement – improving people's moral behaviour through modifying their biology. 'Essential to any discussion on a new morality,' says Prof. Savulescu, 'is biology'.

'Drugging' people so they become more peaceful or cooperative may make many feel slightly uncomfortable, but, says Prof. Savulescu, we are doing it already.

'There are already people being morally modified by drugs they are taking,' he says. 'There are many drugs that increase the level of serotonin in the brain, make people more willing to forgive transgressions or unfair offers, and make people less willing to harm others. The most commonly used morally active agent is a substance that up to 10 per

cent of children are on, which is Ritalin.

'Ritalin is a very important drug because it allows people to exercise more impulse control. It enables them to defer a small reward now for a larger reward later. So it's hugely important for academic performance and life in general.'

'Did you know, if you give Ritalin to criminals who have been convicted of violent crimes, you reduce violent re-offence by 30 to 40 per cent? If you prevent people from committing violent crime by improving their self control, that's a moral bioenhancement.'

'Another area of current moral bioenhancement that is used widely in the USA and around the world, is the hormonal castration of paedophiles.'

'When people say, oh no we should never use drugs, they fail to understand that all of us differ in the level of serotonin in the brain, the level of oxytocin in the brain, the level of self control we have, and some people are very disadvantaged in their own lives or represent a social risk.'

'I'm not saying drugs are the solution to terrorism and all challenges we face, but it shows that we can change human behaviour by changing our internal chemistry.'

'We need our policies to be based on two things: science and ethics, and at the moment they are based on neither. They are based on faith, ideology or economics.'

Prof. Savulescu believes that creating new morals or ethics isn't a question of popularity or the uncovering of mysterious universal truths.

'Take a typical question in medicine, which is: should you live longer with lower quality of life, or shorter with a better quality of life? There's no absolute answer.'

“

We are essentially biologically and psychologically the same as our hunter-gatherer ancestors... They often had to compete with other tribes for resources, and sometimes they would cooperate. This is where our whole basic morality comes from.

'It's not a matter of doing a poll and finding out what people think of longevity and doing what they want.'

A typical ethical research project involves examination of the historical approach to an issue through the lens of reason, says Prof. Savulescu.

One research project his team is involved with at the moment is the proposed introduction of a sugar or fat tax as a way to address the obesity epidemic.

'So we start by gathering the evidence about the effect of sugar on things like behaviour, the cause of obesity – the scientific research.'

'Then we do all the ethical research. We look at what policies countries have had, what the reasons behind them were, what effects they had, what reasons people were given for it.'

Bioethicist Tom Beauchamp developed four principles that ethicists often use to feed the discussion and ultimately form policies and law. They are: respect for autonomy, don't harm people, benefit people and justice.

Although redefining a society's moral code may not be the quick fix many would hope for, Prof. Savulescu says it is our best chance for survival.

'When we look at the great problems of today – issues like migration, the threat of bio-terrorism and poverty – the solutions we are choosing are just Band-Aids. A new tax or a restriction on immigration, for example, doesn't really address what sort of beings we are and how we should live.'

'We must openly embrace rethinking our social and political institutions and the ways we treat ourselves and each other.' ❶

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www.practicaethics.ox.ac.uk



▲
IMAGE:
Courtesy of Kostas Papafitsoros

INTERVENTION

OR



What happens next is entirely determined by temperature.

FEATURED: Graeme Hays

Alfred Deakin Professor and
Chair in Marine Science



IX WEEKS AFTER EGGS WERE LAID IN A nesting beach on the coast of Australia, one tiny sea turtle makes her way to the surface. As she begins the perilous journey across the sand to the sea she is followed by another hatchling, another female.

Then another, also a female. Then another female and another female and another female. Of a clutch of 100 turtles, almost all are female. And that's a problem.

'Sea turtles are not born with sex chromosomes,' explains Deakin University's Professor of Marine Science, Professor Graeme Hays. 'At the time of conception, sex is indeterminate. An embryo can develop into a male or female. What happens next is totally determined by the temperature.'

While every credible scientific body is warning of the dramatic impacts climate change will have over the next century, Prof. Hays' doomsday scenario may be happening now.

'A little difference in temperature makes a profound difference to sea turtles,' he says. 'The key temperature for sex determination is 29°C; that's the pivotal temperature. So at 28°C there would be more male hatchlings, and at 30°C there would be more female hatchlings. At 29°C you get some of both.'

Already, he says, rising temperatures are seeing the feminisation of many sea turtle colonies in the world.

▶ **IMAGE:**

Courtesy of RD & BS Kirkby

'Rising temperatures could potentially lead to the production of all female turtles, and then ultimately that would lead to extinction,' he says.

As the world's nations tackle dangerous climate change by determining carbon emission reduction targets and establishing renewable energy industries, Prof. Hays and his team's work is happening at the grass roots level.

'We observe the changes caused by temperature, make well-informed predictions about how climate change is going to impact, and then develop management options,' he says.

'Our work is not done in a laboratory. All our work is going out and looking at how different temperatures impacts various aspects of an animal. Once we understand the role of temperature, we start to think about how temperature change may impact the animal.'

In addition to their work with sea turtles, the Deakin research team are also looking at the role of climate change on plankton colonies.

'Any change in plankton can be incredibly profound,' he explains. 'The entire food chain depends on what's going on with plankton. Fish numbers and where the fish are depends on habitats, and how small fish are feeding.'

Prof. Hays recalls an incident in the 1970s when the number of cod in the North Sea,

30°C

29°C

28°C



off Wales, skyrocketed. 'Cod became super abundant,' he says. 'The fisheries flourished and everyone was a little bemused. It has taken 30 to 40 years for scientists to work out what had caused this abundance – and what had actually happened was there had been a change in the plankton.'

'It had been the perfect storm,' he says. Plankton in the area had flourished at exactly the same time as the cod had spawned.

'There was nothing wrong with having too much cod, people like cod,' he says. 'But the reverse scenario would be if there were too many cod, if they spawned at the wrong time of year and there was no food for them. That would be a disaster.'

A key part of Prof. Hays' research is devising interventions that can be put in place should data indicate the beginning of a particular scenario.

'We think of simple management interventions,' he says. 'In the case of sea turtles, it's about how to cool the nesting area.'

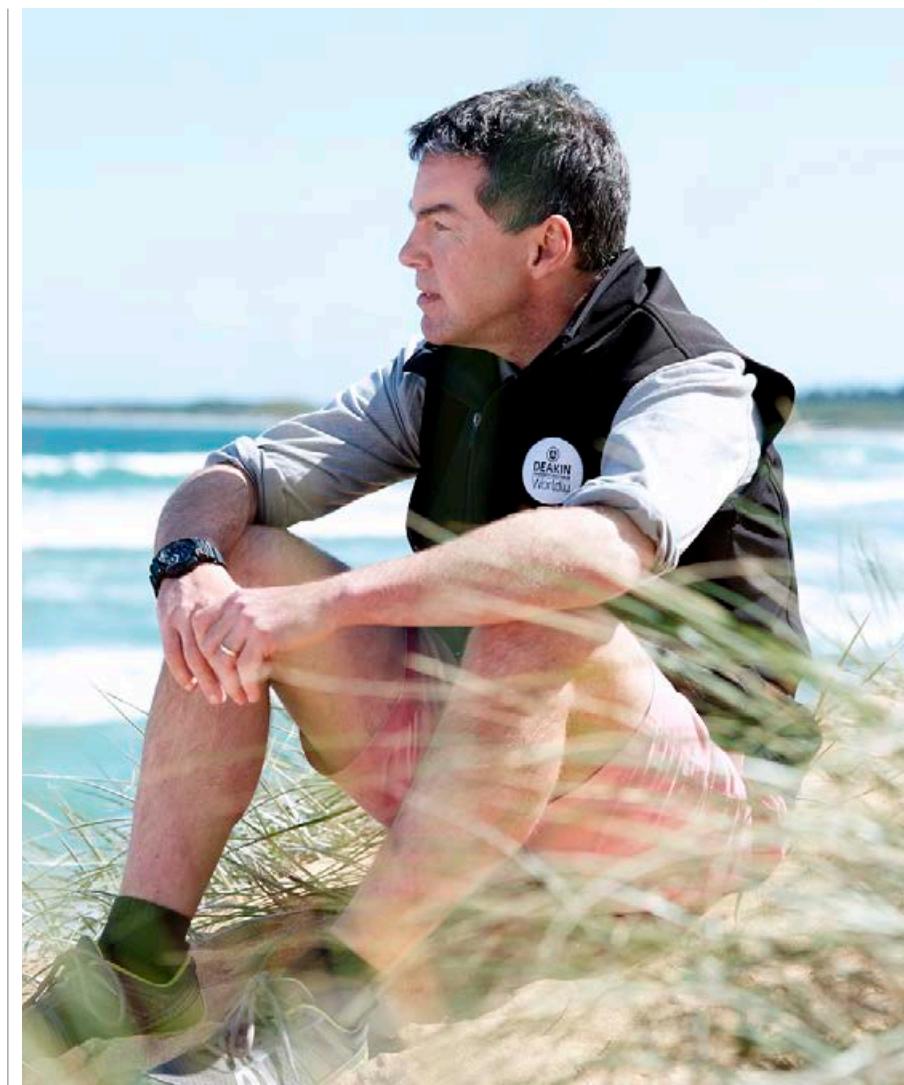
'Shading could be a primary mechanism, and then the question is how do you achieve that shading? You could have man-made tent structures that you put over the nest to shade them, or potentially you can water the sand. But some interventions are more labour-intensive than others. You might have 30,000 nest sites in a country, and then you would have to go and water them all.'

PROPORTION OF FEMALE TO MALE TURTLE POPULATION



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A little difference in temperature makes a profound difference to sea turtles. The key temperature for sex determination is 29°C; that's the pivotal temperature.



'A better solution might involve planting vegetation at the back of the nesting area to shade the nests.

'So, we go to parts of the world where the nesting areas have shaded vegetation, palm trees and the like, we look at the natural variability in temperature, and we start to get quantitative estimates about vegetation that can be used.'

Things get a little trickier when it comes to changes in plankton. 'It's practically impossible to change plankton,' Prof. Hays says, 'So what you have to do is observe and be prepared for the impact of the changes.'

'If there's a type of fish that has been commercially fished in the past which is less abundant, other species will need to be fished. There will need to be a lot of public education to go along with it. We are conservative when it comes to eating fish, and that will need to change. Celebrity chefs have been particularly helpful in beginning to show people what you can do with different types of fish.'

Although the research of Prof. Hays and his team doesn't tackle the major dangers of climate change – health, industry, and large scale disaster, for example – it is more likely to be acted on.

'The less money it will cost to prevent a scenario, the more it becomes a possibility,' he explains. 'We say, here are some simple solutions that will prevent extinction, and suddenly they become a possibility. Everyone thinks that has to be a good idea.'

Never stop discovering, never stop learning.
tinyurl.com/turtlehays

Ever since the words ‘global warming’ and ‘climate change’ entered our vocabulary, and ever since kids started looking to the sky, squinting in the sun, trying to catch a glimpse of that terrifying hole in the ozone layer, mankind has searched for ways to rid the atmosphere of greenhouse gases and carbon dioxide.

BLUE CARBON

AT THE FOREFRONT HAVE BEEN

scientists and greenies, united in a call for trees to be saved. Trees are the answer, they cried. Trees trap carbon from the atmosphere. Save the Amazon rainforest and we’ll save the planet. And since then, trees, with their amazing powers of carbon sequestration, have been a central part of every country’s climate change strategy.

But according to Deakin University researchers, we should be casting our eyes not just to the forest, but also to the oceans. Their research is revealing our oceans to be powerful for carbon sequestration.

‘Most people know that trees store carbon and offset atmospheric carbon emissions,’ says Dr. Peter Macreadie from Deakin’s School of Life and Environmental Sciences. ‘But few know that our coastal ecosystems are much more efficient as carbon sinks.’

Dr. Macreadie is currently heading up research, which focuses on managing coastal and wetland ecosystems, such as seagrass

meadows, tidal marshes, and mangrove forests, for the purpose of maximising carbon sequestration and minimising carbon losses.

It’s called ‘blue carbon’ and, according to Dr. Macreadie, it has the potential to seriously help mitigate the catastrophic potential of climate change.

‘There has to be a two-pronged approach to dealing with climate change: one, to reduce carbon emissions, and two, do something with the existing carbon in the atmosphere,’ he explains.

‘The term “blue carbon” refers to the carbon sequestered in vegetated coastal ecosystems, specifically mangrove forests, seagrass beds and saltmarshes.’

Blue carbon ecosystems, he continues, are simply a more efficient means of carbon sequestration than trees and forests.

‘These blue carbon ecosystems make up only 0.2 per cent of the ocean floor, yet sequester around half the ocean’s carbon. They’re remarkably efficient carbon sinks; they

sequester carbon in soils 40 times faster than rainforests.

‘They also store carbon for much longer. Trees store carbon as plant biomass, but when they die the carbon is mostly released. So the best you can hope for is the carbon to be stored for the life of the tree, which is often only decades. Blue carbon ecosystems actually draw the carbon down and store it in the earth, and by doing so they can retire carbon for thousands of years.’

The problem is, says Dr. Macreadie, about half the world’s blue carbon ecosystems have already been destroyed by human activities.

And when that happens, not only is the ability to store future carbon emissions diminished, but the carbon that is already stored in them can leak out from underneath the ground and into the oceans and atmosphere, thereby accelerating climate change.

In 2011, as a tool for its proposed emissions trading scheme, the Australian Government devised a mechanism that enabled business

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Trees store carbon as plant biomass, but when they die the carbon is mostly released. So the best you can hope for is the carbon to be stored for the life of the tree, which is often only decades.

and government to put a price on Australia’s carbon pollution. Although the scheme was eventually repealed, the carbon pricing mechanism did allow scientists like Dr. Macreadie to put value figures on coastal ecosystems.

‘If you say that carbon dioxide is worth \$23 a tonne, then the carbon bound within the top 1 million of Australia’s blue carbon ecosystems is worth about \$77 billion,’ he says.

Dr. Macreadie is hoping that his research educates the wider public and lawmakers on the value of coastal ecosystems, and leads to better protection of them.

‘With blue carbon we have an innovative solution for helping to mitigate climate change, while also improving natural capital, and contributing to jobs, economic growth, capacity building and community wellbeing,’ says Dr. Macreadie. 



FEATURED: Peter I. Macreadie
Senior Lecturer – School of Life and Environmental Sciences & Head of the Blue Carbon Lab – Centre for Integrative Ecology
Deakin University

Your connection with Deakin University does not end when you graduate. Our Alumni Community Program is designed to offer you meaningful lifelong engagement, no matter what stage of life you are in or where you are across the globe.

As an alumnus you have access to a range of exclusive benefits. From networking, career development and mentoring opportunities that are designed around your disciplines and interests, to online resources and publications. Annually our Alumni Community Program delivers around 100 events domestically and internationally spanning a range of topics. Our award-winning alumni magazine dKin is produced to provide you with insight into the diverse and deep influence Deakin has on world matters.

We invite you to learn more about our program by visiting deakin.edu.au/alumni

Our alumni program is developed for you. For it to be successful we need your involvement. We want to learn about and share your experiences of Deakin. Collectively you have taken many and varied paths, and we want to reflect and celebrate that diversity and depth in our stories. It is through the sharing of your personal insight and journeys that others are inspired. Please add your story to Deakin's tapestry.

Let's continue our conversation together and build a vibrant national and international alumni community. Give us your feedback, keep in touch, and remember, your university values your engagement. Update your contact details and alumni account at: engage.deakin.edu.au or visit deakin.edu.au/alumni

NETWORKS

With more than 220,000 alumni across the world, in over 110 countries, Deakin's alumni network is vibrant and diverse. Our networks have been formed on the basis of shared interests, field of study (faculty/school) and geographical location. We are a worldly community and our graduates reflect the university's international focus. Our graduates keep in touch from all over the world and continue to enrich the academic and social life of Deakin.

Alumni networks and chapters provide you with the opportunities to connect through networking and social events, reunions and tailored professional development. We encourage our alumni to participate in the various activities offered by our networks and to join in and contribute to their management and development. New networks are being established all the time so there is surely one to suit you! Be part of this active on-going global conversation.

ALUMNI POSTGRADUATE COURSE FEES BURSARY – ENROL TODAY!

In support of our commitment to providing lifelong learning opportunities for our alumni globally, our alumni, their children and spouses can receive a 10% bursary from the cost per unit of postgraduate studies. This offer is only available on new postgraduate award course enrolments during the 2017 academic year and covers the duration of the chosen course. Conditions apply.

Visit the Deakin Alumni website at deakin.edu.au/alumni for more details and application forms.

DEAKIN ALUMNI AWARDS

Our distinguished Alumni Awards are held annually to recognise, acknowledge and celebrate our prominent alumni from around the world who have achieved outstanding success within their career or community by demonstrating leadership and achievement.

LIBRARY MEMBERSHIP

No matter where you are, you can access a number of library and information resources through the Deakin University Library.

Alumni can sign up today at deakin.edu.au/library/join. Membership is free to access selected digital resources and borrow books from campus libraries.

GIVING TO DEAKIN

Giving is a very personal act. It is why, in most cases, those that give feel they have gained just as much from the experience as those actually receiving their gift.

Deakin continues to receive generous support from friends and alumni worldwide. This has helped the university to augment funding provided by the Federal Government and maintain the quality of its educational programs and learning environments, as well as deliver research that impacts on the communities we serve.

In the future, your university will be increasingly reliant on support to continue to fund new programs and initiatives,

scholarships and facilities.

Through leadership in giving, we inspire others – it's not how much you give, it is that you give and believe you can make a difference in the world. There are a number of ways you can support Deakin, they include:

- **Student scholarships** – Deakin

is committed to offering educational experiences that widen participation and support students from diverse backgrounds. Help students access, participate and achieve through higher education by giving to the Open Minds, Open Possibilities humanitarian scholarship fund.

- **Grants and donations** – your donation may be in the form of a monetary grant or a gift of a significant item: for example the giving of a historic book collection to the library, an artwork to the university's collection or materials for use in education and research programs. You can also direct your gift to a particular program, initiative, faculty or research center.

- **Major gifts** – the gift of learning and pioneering research is changing lives now and will continue to well into the future, as well as make a difference to communities here and around the world. A dedicated team here at Deakin works closely with individuals, trusts and foundations, and the corporate sector to match those with an impulse to give, with Deakin's own funding priorities. This team is highly motivated to ensure your gift has a lasting impact.

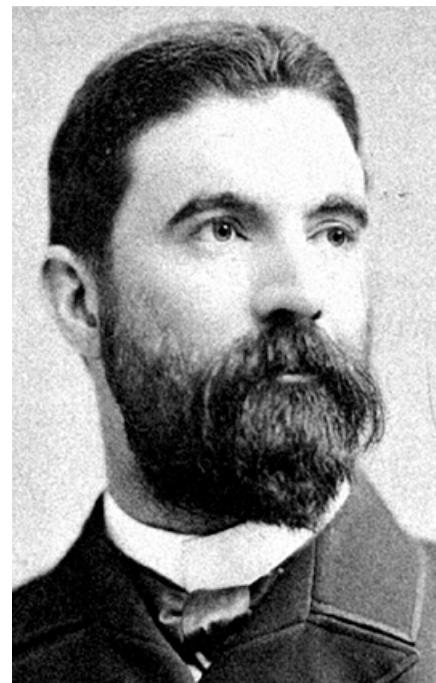
- **Planned giving** – an estate gift is much more than a financial decision. It's a personal statement about who you are and what you care about. You can give to Deakin through bequests, wills and trust, distributions leaving a lasting legacy to assist students and research projects that will transform the lives of future generations.

For more information on giving to Deakin, visit deakin.edu.au/giving or email giving@deakin.edu.au.

ALUMNI RELATIONS OFFICE

The Deakin Alumni Relations Office has been established to oversee, provide specialised support for and coordinate alumni activities and communications for the individuals, networks and interest groups that form part of the global Deakin alumni community.

Contact the Deakin Alumni Relations Office at: *Melbourne Burwood Campus Burwood Victoria 3125 Australia*
Phone +61 3 5227 1019
Email deakinalumni@deakin.edu.au



Alumni Class Notes

Deakin Alumni have taken many varied paths, and it is important that this diversity and depth is both promoted and celebrated. The importance of shared experience cannot be underestimated. It is the personal stories that inspire, make us reflect and even change our life attitudes and direction.

Nino Ficca (*Bachelor of Engineering (Honours) 1982, Graduate Diploma of Management 1994*) has spent the last decade as Managing Director and CEO of Victoria's largest energy delivery service, AusNet Services. Following graduation from Deakin, Nino has enjoyed a career spanning more than 30 years in the energy sector, resulting in him becoming one of the industry's most respected figures. He recently spearheaded a scholarship initiative that promotes careers for women in the energy sector and in 2014, was the recipient of the Deakin Alumni of the Year Award.

Judith Kohn (*Master of Business – Sport Management, 2009*) is an internationally awarded athlete and director of Melbourne-based sporting and fitness goods business Mat-tastic. From the track to the office, Judith's on a mission to keep the country fit and healthy.

Armed with a master's degree in Sport Management (Hons) from Deakin, another degree in Applied Science (Human Movement) and 15 years' experience in physical education, Judith built Mat-tastic from an innovative product into a thriving business over the last two decades.

Along with her twin sister, she represented Australia seven times in the Maccabiah Games – the first Australian women to do so – winning bronze in javelin. She has also won three gold, one silver and one bronze medal for road relays and cross country events at the Australian National Championships.

Disclaimer: Mat-tastic (mat-tastic.com.au) is a donor to Deakin University.

Deakin University is actively seeking the involvement of alumni to share their personal experiences of Deakin and life. Tell us your story deakinalumni@deakin.edu.au

David McAllister AM (*Graduate Diploma of Arts and Entertainment Management 2000*) recently celebrated 30 years with The Australian Ballet.

David began with the company as an internationally acclaimed dancer, before further development and success put him on the path to becoming the Artistic Director – a position he has held longer than any other in the company's esteemed history.

For his contribution to the performing arts, David was awarded an Order of Australia in 2004 and in 2012, he was the recipient of the Deakin Alumni of the Year Award.

Jessica Holsman (*Postgraduate Diploma of Psychology 2014*) applied the study skills she learnt at Deakin to create her successful YouTube channel Study With Jess to help other students improve their study habits and encourage them to enjoy their learning process.

As well as being a successful YouTube personality with a dedicated audience of students, Jessica has launched a line of educational stationery products called seed.ED Educationery. She cites the support and encouragement she received from Deakin faculty as part of what fuelled her passion for education and her mission to make academic skills and support more accessible.

Study With Jess is the first YouTube channel of its kind and it has clearly struck a chord with its audience, clocking up over one million views in its first six months. **i**

▲
IMAGE:

Courtesy of the Alfred Deakin Prime Ministerial Library

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IMAGE (REVERSE):

Courtesy of Kostas Papafitsoros



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