

**Skeptic**

*a person who looks for the simplest explanation first,  
but is willing to consider other possibilities in the light  
of unambiguous evidence*

**Scientifically determined morality**

**A New Age skeptic**

**Fake photos**

**Alternative cancer clinic**

**Skepticism in the classroom**

**Science at universities**

new zealand  
**Skeptic**

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### Deadline for next issue:

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Letters for the Forum may be edited as space requires - up to 250 words is preferred. Please indicate the publication and date of all clippings for the Newsfront.

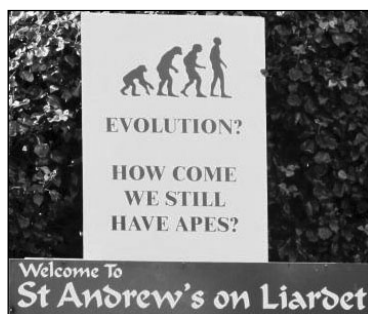
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# Thoughts on a billboard



ON a recent visit to New Plymouth I was rather taken aback to see a billboard outside a central city church posing the question: “Evolution? How come we still have apes?” It wasn’t so much surprise that someone could know so little about evolutionary theory that they would think this was a persuasive argument – versions of this are often to be seen in the less sophisticated creationist publications – it was more that they should feel the urge to display their ignorance on a busy street corner.

The question is easily answered: it’s a bit like asking someone why there are still Scots if their ancestors came from Scotland. Evolution proceeds through localised change in sub-populations, not wholesale transformations of species across their entire range – and none of the modern ape species are ancestral to us in any case. One could also ask why, if humans were created separately from all other animals, there are animals which are so much like us – in other words if creationism is true, why are there apes at all?

I was reminded of a trivia word game my daughter once played, in which the clue was “Darwin’s theory of evolution”, and the answer was “natural selection”. The person who failed to answer this asserted she couldn’t be expected to know such things, since she didn’t believe in evolution. The same principle seems to apply at the New Plymouth church – decide you don’t believe in something, then refuse to learn anything about it. This has got it backwards, of course; if you’re going to disbelieve something, the least you can do is find out what it is that you don’t believe in.

The same challenge is often thrown at skeptics by believers who are convinced that if only we read the literature on homeopathy, or chiropractic, or UFOs or whatever, we would see the truth of their claims. While it isn’t necessary to have detailed knowledge of every last wacky idea – if it defies basic laws of physics and chemistry it’s almost certainly bunk – the irony is that many skeptics are very well informed about such things, and disbelieve because of what they know rather than what they don’t know. In the end though, it isn’t knowledge or the lack of it that makes the difference between a believer and a sceptic (whether they be sceptical of evolution or homeopathy), it’s the habit of critical thought – or the lack of it.

*David*

# The magic of morality: scientifically determined human values

Mark Ottley

*Ethics and morality are often regarded as beyond the reach of scientific inquiry. But certain values appear to be shared by all humans as species-typical adaptations. This article is based on a presentation to the 2011 NZ Skeptics conference in Christchurch.*

It was a pleasure to speak at the annual New Zealand Skeptics conference last year and hear from people representing a rich variety of scientific disciplines and other community organisations. A special thank-you to everyone who travelled from outside of Canterbury to support us following the recent earthquakes. I'm sure your lives are richer for visiting what is left of our city and sharing a few mild aftershocks with us! We enjoyed the morale boost from the weekend of friendly visitors, thoughtful presentations, light-hearted poetry, feasting and court theatre jesters, and the general atmosphere of proactive prosociality.

Relating to all these matters in the broadest possible sense, I discussed the subject of *morality and morale*. The theme of the conference was 'building on solid science', and I suggested that human wellbeing might be built upon a body of six core values. While my talk and this article are insufficient to address

the topic fairly, I think a useful introduction can still be made, while avoiding an approach that would be either too complex or simplistic. I also mentioned the matter of priority – there may be many things that are important, but if everything is important, then nothing is important. Here I am aiming for what is most important.



Mark Ottley at the 2011 NZ Skeptics conference.

I welcome questions, criticisms, assistance, and general sceptical inquiry of the points I make. Working as a clinical psychologist in a hospital injury and trauma service following the earthquakes, I cannot guarantee

I will have time to respond individually to such feedback, but I will read it all and please know that I sincerely appreciate it.

## What is Morality?

Morality is a subject that addresses big questions of existence. Who am I? Why am I here? What should I do? With varying degrees of awareness, everyone learns answers to such questions through processes of imitation, instruction, and inference. The answers take the form of moral models, which are ideas about *human nature* and *right and wrong*. Such models are explicit (acted upon with reflection), or implicit (acted upon without reflection), and impact the wellbeing of humanity's billions on a daily basis.

Historically, considerable scepticism about moral models has been evident. "Those who promise us paradise on earth never produced anything but a hell," stated our own Professor Sir Karl Popper, summarising



prior efforts of a utopian character. However, within many academic disciplines there has been an even stronger statement, a Humean consensus that science must concern itself with answering descriptive 'is' or 'fact' questions, rather than prescriptive 'ought' or 'value' questions. This has been accepted as a truism by many, with attempts at scientifically based moral or value reasoning criticised as 'scientism' or the 'naturalistic fallacy', with dire predictions.

Challenges to these charges of scientism have arisen in recent years (Baschetti, 2007; Brinkmann, 2009; Kristjansson, 2010), perhaps most influentially and eloquently from the philosopher and neuroscientist Sam Harris, in his 2010 book *The Moral Landscape*. In his book, Harris attacks moral relativism with a perceptive argument for scientific moral realism. As Harris explains, every single scientific 'is' statement ultimately rests upon implicit 'ought' statements – "all the way down" (p 203).

What logic can prove logic itself? What if you don't value logic or empiricism? In such a case you destroy *all* of science, not just moral claims.  $2+2=4$ , but only if you value mathematics. If people do not share such values there may sometimes be no way to convince them. However, there is also no need for the rest of us to take their arguments seriously either – any more than we need to convince everyone that physics or medicine can be helpful before we use it to improve at least our own wellbeing. Harris also argues that moral claims are universally claims

about the wellbeing of conscious creatures (real or imagined), an area increasingly well illuminated by neuroscience and other sciences of the mind. In reality there is no choice but to go from 'is' to 'ought' and science offers the safest path to action, due to the collaborative scepticism and

### **Six values ... appear to be universally shared by humans as species-typical adaptations**

empiricism of scientific peer review process. These points and more are elaborated upon in his book, and I recommend reading it to examine the case in persuasive detail.

#### **Ultimate, Universal, Unavoidable**

*The Moral Landscape* argues that a science of human wellbeing is possible, based upon neuroscience and other sciences of the mind. Indeed, this is the very field of clinical psychology, broadly defined. Given evidence emerging and converging from the scientific literature, I would like to advance further and suggest that human wellbeing may be associated with six core moral values that are ultimate, universal, and unavoidable. I will briefly summarise and explain what I mean by this.

I use the word *ultimate* in the sense of evolutionary origins (Scott-Phillips et al, 2011) and values coded at the level of the genotype (Yamagata et al, 2006) that develop through processes of epigenesis (feedback effects of culture/environment upon genetic expression). Simply put, social organisms including

humans must develop systems to (1) perceive patterns in their environment; (2) allocate time between competing needs; (3) regulate social relationships; (4) value inclusive fitness; (5) defend against threat; and (6) maximise all of these abilities within homeostatic limits. Certain system organisations tend toward Nash equilibrium or evolutionarily stable strategies, that outcompete other strategies. In other words, these values may not only be how life *is*, but how life *must* be, for reasons ultimately reducible to the laws of chemistry, physics and mathematics. Historically, evolutionary modelling using game theory simulations has been a prominent scientific tool in exploring the nature of such systems, for example in the domain of social relationships (Axelrod & Hamilton, 1981).

Six values also appear to be *universally* shared by humans as species-typical adaptations, as suggested by psycholexical and cross-cultural research. Psycholexical theory posits that because languages evolved, they are likely to contain words for patterns in the world (including patterns of valued personality) that are important to human wellbeing.

Across world languages, the thousands of words for describing personality appear to cluster in six main domains (Lee & Ashton, 2008). Additionally, across world ethical codes, philosophies and religions, six core values seem to be shared. They apply across the literature traditions of Confucianism, Taoism, Buddhism, Hinduism, Athenian philosophy, Judaism, Christianity,

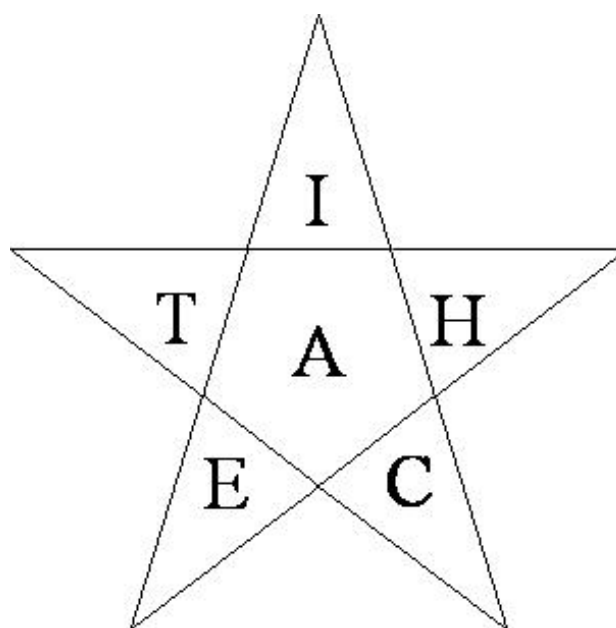
Islam, and also seem integral to oral traditions ranging from the Masai of the African savannah, to the Inughuit of Arctic environs (Dahlsgaard, et al, 2005). Specific expression of these varies, as do a range of non-shared values. However, the cross-cultural nature of these six core values refutes claims of moral exclusivity by any one tradition, and given the thriving of societies lacking the non-shared values, these appear less generally important and perhaps even obfuscating or detrimental in some cases (Paul, 2009).

Six values also seem *unavoidable*, in the sense that people must develop them to at least a minimum degree to survive, and to a higher degree to thrive. Failure leads to high levels of dependence or institutionalisation – ranging from requirements for supported living arrangements, to psychiatric hospitalisation or prison. For example, low levels of intelligence characterise intellectual disability and dementia, and low levels of altruism characterise psychopathy. Conversely, high-level development of such values aides flourishing – enhanced wellbeing via autonomy, social connection and competence. These patterns of negatively and positively developed characteristics are the focus of psychiatry and clinical or applied psychology.

### I.T.E.A.C.H.

I have used the mnemonic I.T.E.A.C.H. to summarise six values, each letter representing a value word. An important caution is that this word set is

only one possibility from hundreds of potential words across the six domains (Ashton et al, 2004). It is selected for memetic reasons, including being easy to remember, descriptive and prescriptive – and with the star for associations with light and enlightenment, bright and magical things, aspiration and inspiration, and matching the embodied metaphors of our intuitive folk psychology (Blackmore, 1999; Seitz, 2005; Winne & Nesbit,



2010). You probably have your own meaning attached to these words, but that meaning is not what I mean, or at least not only. Instead they refer to diverse but related phenomena across physical, biological, psychological and sociological levels of knowledge (Henriques, 2003), with consilience or ‘unity of knowledge’ as an aim (Wilson, 1998). “Words are only tools for our use” as the biologist Richard Dawkins has said (Dawkins, 2006). Nonetheless we must choose some words to use and these seem adequate. Choose your own if you prefer.

To briefly summarise these values then, *Intelligence* might

be parsimoniously defined as pattern recognition, with some other words that cluster in this psycholexical domain being knowledgeable, perceptive, educated, curious. *Temperance* refers to the ability to temporally sequence actions adaptively, with some other words in this domain being conscientious, self-disciplined, organised, systematic. *Equality* refers to the ability to maintain mutualistic or non-zero-sum social relationships, with some other words in this domain being just, fair, honest, humble. *Altruism* refers to helping, with some other words in this domain being kind, warm, generous, compassionate. *Courage* refers to the ability to tolerate distress, with some other words in this domain being resilient, tough, intrepid, and brave. Lastly, *Holism* may refer to the ability to integrate the other five virtues, transcend prior limitations, and connect as part of a larger socio-cultural, and even

evolutionary and cosmological perspective. I suspect other words in this domain reflect the frequent social context or status of such endeavours, with words such as extroverted, vivacious, inspiring, and spirited.

### Building a Stronger Culture

*The Moral Landscape* argues that we should build morality upon solid science. In this article I have provided a brief glimpse of how, suggesting attendance to six core values. Development of such values is associated with increased wellbeing and decreased physical and mental health problems, as demonstrated by many

randomised placebo controlled clinical trials (the scientific gold standard) of psychological interventions. The evidence is good enough to begin applying scientific approaches to wellbeing on a larger cultural scale than is currently the case (Henriques, 2005; Seligman, 2011). Data collected on the way can be used to adjust and amend approaches, via evolutionary processes of cultural variation, selection and retention. This is temperate scientific progress, rather than hotly impulsive or coldly compulsive dogma.

At the conference I was asked about development of these values, and about the role of the golden rule (“consider yourself and treat others accordingly”, as stated by Confucius for example) – widely known as a culturally universal endorsement of altruism. As suggested by its position in the star, altruism is central to the development of other values through valuing the wellbeing of self and others. Mammalian brains do not self-assemble like those of many reptiles, but rely upon nurturance to reach their full potential (Hrdy, 2009). Altruism has ultimate origins in evolutionary processes such as kin selection (Hamilton, 1964) and (together with equality) reciprocal altruism (Trivers, 1971). Parallel to this, skeptical inquiry is a process fostering the accurate pattern recognition that characterises intelligence. Yet, as I said at the conference, altruism alone is as useless as a body without head or limbs, incapable of seeing wisely or acting effectively – and intelligence alone is as a head detached from body and limbs, potentially lost in autistic pattern seeking or

psychopathy. And even head (I) and heart (A) are lame, without arming methodically for action (T), standing as two to exceed the power of one (E), stepping forward despite distress (C), and reaching forever higher to transcend what has gone before (H). Simplified even further – head and heart, standing together, standing strong, and reaching out to help.

We aim to build our most important cultural institutions upon solid science rather than superficial superstition. Our challenge is to speak comprehensively but comprehensibly and reach as many people as possible. At the conference, chemist Michael Edmonds spoke of our chemical origins in the heart of stars as “starstuff”, and biologist Alison Campbell of our biological origins in the great evolutionary tree of life. In this manner an evolutionary cosmology to which we all belong is now introduced at new entrant level in our schools, providing fertile ground for sustaining knowledge to grow.

In terms of physics we are matter and energy, creating and destroying, yet neither created nor destroyed. Awareness emerging, submerging and re-emerging, evolving as it is revolving. As a psychologist, I am aware that to grow starstuff into flourishing form, human genes need memetic light. Symbolic linguistic devices such as these words, the “Bright-Star” above or Humanist symbol below, are examples of memes that might aid the teaching of scientifically based morality and brighter prospects for individual and collective wellbeing.

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“When will you attain this joy?

It will begin when you think for yourself,

When you truly take responsibility for your own life,

When you join the fellowship of all who have stood up as free individuals and said,

‘We are of the company of those who seek the true and the right, and live accordingly;

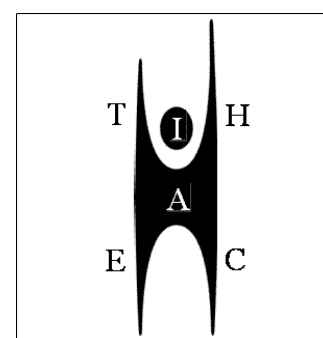
‘In our human world, in the short time we each have,

‘We see our duty to make and find something good for ourselves and our companions in the human predicament.’

Let us help one another, therefore; let us build the city together,

Where the best future might inhabit, and the true promise of humanity be realised at last.”

*The Good Book 9:4-11* (Grayling, 2011).



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# Confessions of a New Age Skeptic

Donald Pettitt

*How should a skeptic relate to those who have other belief systems?*

WHAT does a skeptic and atheist do when they are part of a broader group that is quite loose on empirical evidence and critical thinking? A lot of us experience this to some degree, but I've wrestled with my engagement with a particular group I'm fond of for the last 20 years.

*Convergence: Beyond 2000* (previously, "Towards 2000") is an annual camping event that takes place in North Canterbury over the New Year break. Its tag line is: "Gathering every year for a co-creative festival celebrating nature, spirituality, love, and healing". The event is alcohol and drug-free, has good facilities, and includes about 350 people.

*Convergence* is a place where the cultural norm is one of suspension of disbelief. All of the typical energy healing models are practised and taught there in workshop context by volunteer facilitators. Reiki, guru aspirants, channelers, tarot card readers, Mayan calendar adherents, fairy lovers, tantric energy, *The Secret*, massage healers ... well, where do you stop?

I found myself coming along to the events first in 1992. I'd migrated from Canada and my flatmate and all his friends, who were a playful, friendly bunch, went every year and I was drawn into it. I was still coming out of 12 years of study and work as a mechanical engineer installing computer systems into paper

mills and was quite happy to regress into a less linear approach to my perception of life and how to live it.

My first year I was quite guarded, being aware that there are people out there that attempt to get people away to events "just-like-this" with the aim of drawing them into some sect or other. All the warmth, playfulness and affection that seemed to be happening was pretty overwhelming and I felt I stuck out like a sore thumb. Fortunately, it wasn't a sect, and I wasn't pressured to be "one of us", and I was generally engaged with at a warm, receptive level.

At *Convergence* in the first few years I remember often feeling discomfort while the friend

I might be walking or talking with would leap joyfully into the arms of someone they knew from previous events. It took a lot of self-reassurance to stick with it, and in time I found myself being outrageously affectionate as well, and carrying that forward into my life. I've made a lot of friends at *Convergence*, and found my last two partners there as well (having a child with both of them). So, there have been a lot of good times inside my relationship with the group.

My other exposures to "hooey" weren't disturbing. I'd lived already for a few years on a hippy commune near Motueka where I'd seen any number of loose approaches to life. In a way, it made me feel more sane being around people that I was genuinely very fond of but that obviously had one or two screws loose and rattling around.

This Xmas, having recently turned 50 and after having gobbled up the the *Skeptics Guide to the Universe* (and other skeptic podcasts) I joined the ranks of the NZ Skeptics. I've finally come to the conclusion that I'm an atheist, a humanist, and I'm going to share that when it is relevant.

It's still a learning experience for me. When do I say something? If a friend talks about the great course in acupuncture that they are in their final year of do I say what I believe? No, I haven't, not often. But I do wonder the cost in not saying something. Did we lose an opportunity for intimacy? Did I miss giving them a test to their chosen life path, possibly sparing them some wasted years of hand-waving healing modalities? I'm still not clear on that one, being new to this.

"What's the harm" is a classic response. I've reflected on my hippy years and now realise there was harm. The anti-vax/DIY home-birthing (without adequate support) crowd had three kids that are still paying the price. I've supported the deaf community as a social worker and found that there are years during which a lot of them go through milestone birthdays (anti-vax again). I've had my kids treated with bogus, outwardly professional therapies (waste of cash and time).

This year, when I went to *Convergence* I found the issue of my personal beliefs much more emotionally charged. I told quite a few people that I met that I had

'come out' as a skeptic. In saying this, I found others that shared my feelings.

Encouraged by my gathering support, in front of the whole crowd I 'testified' as an atheist/critical thinker and offered a workshop on the issue. The crowd barked with laughter and good will as I did it humorously. It turned out the others I'd spoken to prior to the meeting had initiated a workshop already!

In the workshop people spoke about the fear of diverging from the group norm, and holding their tongue while others spoke about their wild unfounded beliefs. They mentioned the discomfort of "having to" participate in opening rituals (blessing to the four directions... yadda yadda). And not knowing others that felt the same. We agreed that our general perspective was a healthy one for the festival, and one to be openly celebrated.

Next year we'll open with a workshop for sceptics. It's a beautiful event, and the acceptance is big enough to include critical thinking. And who knows, we may make us a few converts!

[www.convergence.net.nz/wordpress/](http://www.convergence.net.nz/wordpress/)  
Donald Pettit is manager of the Canterbury Men's Centre, Christchurch.

## NEARING ZERO by Nick Kim





# Every picture tells a story – sometimes they're whoppers

Joe Schwarcz

*Pictures don't lie, right? Of course they do. And they were deceiving us long before Photoshop made the manipulation of images almost child's play.*

TODAY, nobody would bat an eye at a ghostly image of Abraham Lincoln standing behind his grief-stricken widow, apparently comforting her. But back in the 1860s when William Mumler produced the first 'spirit photographs' the public was stunned. These photos appeared to show dead relatives hovering around the living subject who had posed for the picture. Photography was magical enough, so it didn't seem such a stretch that the camera could see things that the human eye could not.

Mumler discovered 'double exposure' accidentally when he mistakenly used a previously exposed but undeveloped photographic plate. He immediately recognised the financial potential of this discovery and reinvented himself as a psychic medium who specialised in communicating with the other side through photographs. By today's standards his efforts were amateurish but in the heyday of spiritualism they were readily accepted as authentic. Only when Mumler made the mistake of using images of people who

were still alive as his 'ghosts', did his little scam crumble. But by this time many other 'spirit photographers' had recognised the lucrative nature of the business and had gotten into the game. And amazingly, the clever ruse even snared luminaries like Sir Arthur Conan Doyle and Sir William Crookes. Conan Doyle, the creator of Sherlock Holmes, was a physician and Crookes was a pioneer in chemistry and physics. One would think they would have known better.

Conan Doyle was a staunch believer in spiritualism, a position his famous detective would have taken a dim view of. But it was Sir Arthur's championing of another type of fake photograph that best demonstrates the extent of his credulity. In 1917 two young girls produced a photo that purported to show fairies dancing in the woods. Conan Doyle was convinced the pictures were real and refused to believe that he had been fooled by the simple trick of hanging cardboard cut-outs by a thread in front of the camera. It was inconceivable to him that a couple of uneducated

girls could put one over on someone of his stature. The pictures therefore had to be evidence of the existence of fairies! In 1983 Elsie Wright and Frances Griffiths finally admitted that they had faked the photographs but nevertheless maintained they had actually seen real fairies.

By the time the ladies had unburdened their souls, Roger Patterson and Robert Gimlin had outdone the 'Cottingley fairies'. In 1967 these two thrilled the world by capturing the first images of the fabled Bigfoot. Their short film shows a creature lumbering across the woods, looking very much like a man in a gorilla suit. There is good reason for that. It is a man dressed in a gorilla suit. The elaborate hoax was described in detail at a recent conference on magic history by Phillip Morris, a man who should know, since it was his costume company that provided and altered the gorilla suit used to stage the scene. Needless to say there are legions of Bigfoot believers who don't buy Morris' claim and

## Scientists get government money

A DRUG awareness programme run by the Church of Scientology has received government funding to spread its views through schools and community groups (Sunday Star Times, 19 February).

“Drug-free ambassadors” linked to the church have distributed 130,000 drug education booklets around New Zealand, paid for in part by the Department of Internal Affairs’ Community Organisations Grant Scheme. The ambassadors claim at least 18 community groups – including Maori Wardens, one of whom is also an ambassador – and at least seven high schools, endorse and use the materials.

The pamphlets are based on L Ron Hubbard’s ideas on self-improvement through purging oneself of painful experiences.

NZ Drug Foundation executive director Ross Bell called the information flawed pseudo-science which could prove harmful to youth. “This kind of quackery should not be in our schools – we are talking about young people’s lives,” he said.

Other critics, including former Scientologists, say the drug-free ambassadors are a front group aimed at recruitment which does not openly disclose its ties to the church. The group, which has various aliases, has also come under fire overseas, including in Australia where its links to the government were described as “worrying”.

Scientology New Zealand listed its income for 2010 as \$1.2 million. Drug-Free Ambassadors had an income of approximately \$6700, of which \$6500 was grants.

Green MP Kevin Hague said any funding given to a group that was a front for the church should be stopped. “In the case of someone who is struggling with drugs, they are very vulnerable. So their exploitation by the church for their own ends is despicable.”

### Former Skeptic editor dies

Owen McShane, who was editor of the *NZ Skeptic* from 1994 to 1997, has died, aged 70 (National Business Review, 7 March).

Owen was a longstanding member of the NZ Skeptics and had a regular column in the NBR. He died suddenly at his home in Kaiwaka near Kaipara Harbour, not long after recent heart surgery.

NBR editor Nevil Gibson writes that Owen’s early career encompassed town planning, urban economics and public policy, and he turned to venture capitalism in the 1970s. More recently he established the Centre for Resource Management, a one-man think tank that advocated a laissez-faire approach to environmental and planning issues. Nonetheless he saw himself as an enthusiastic environmental-

ist, advocating a “gourmet culture” for small land-holders, and putting his ideas into practice on his own property.

Owen wrote and published extensively on a wide range of issues. He was a columnist for *Metro* from 1983-94 and launched his own magazine, *Straight Thinking*, in 1994.

He appeared regularly at resource consent hearings after the passing of the Resource Management Act, on which he was a consultant, fighting against what he saw as destructive planning practices such as “smart growth”.

In 1996, he wrote an important report for the Reserve Bank on how planning rules contributed to the high costs of land for residential building – an issue on which the minister for the environment commissioned a further report in 1998.

He was a member of the committee that recommended casinos be established in New Zealand, a member of the Auckland Area Health Board, and was, says Gibson, a sought-after speaker for local and overseas conferences.

### Jesus cures cancer?

A Napier church has raised the ire of locals with a billboard stating “Jesus heals cancer” (NZ Herald, 28 February).

The Equippers Church in Tamatea claims six people have been healed, but Jody and Bevan Condin, whose three-year-old

**NZ Skeptics Conference Registration 2012**  
**Fri 31 August - Sun 2 September**  
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Save 1 80,000<sup>th</sup> of a tree - Online reservations:

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Saturday only – Waged:      \$60   x   \_\_\_\_\_ = \_\_\_\_\_

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Dunedin 9012

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NZ Skeptics – Conference

11-7810-0185045-12

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**ACCOMMODATION**

This year's semester timing means we are not able to arrange hall accommodation for conference attendees. If members wish to stay at Cargills Hotel (678 George Street, 03 477-7983), cite the NZ Skeptics for a discount rate of \$111pp. We recommend you contact them early.

There are a variety of providers around the university, ranging from hotels and motels to backpackers. Contacts for many of these can be found at:  
[www.otago.ac.nz/about/accommodation/otago000807.html](http://www.otago.ac.nz/about/accommodation/otago000807.html)  
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son Toby has leukaemia, said the billboard made their blood boil.

“I was disgusted, I was absolutely disgusted, and I felt quite sick,” said Mrs Condin. “The sign shows no understanding and compassion for people who have journeyed through cancer and lost loved ones.”

Senior minister Lyle Peninsula (yes, that’s his real name) said with the exception of one person, he did not believe the sign was causing offence, so saw no reason to remove it.

The sign may, however, have breached the Advertising Standards Authority’s codes (NZ Herald, 29 February).

The authority said it would take about 25 days to process the complaint. Before that, however, the church modified the sign (NZ Herald, 7 March). It now reads “Jesus heals every sickness and every disease – Matthew 4:23”.

Jody Condin said she felt the replacement was still misleading. She had watched an Equip-ers church-goer on television explaining his belief the church had helped cure his cancer, but felt he came across as believing his religion had mainly helped him spiritually.

“He’d had surgery and medication so how does he actually know that Jesus healed him?”

Ms Condin has received emails and phone calls from fellow supporters across the country, some of whom had lost loved ones to cancer.

Mr Peninsula said religious advertising and freedom of speech were vital components of a democratic society and the

measure ‘truth in advertising’ could not and should not apply for faith-based or religious advertising.

### **Kiwis big believers in homeopathy**

Fifty-one percent of New Zealanders believe homeopathy is scientifically proven, but probably have no understanding of what is, according to a UMR study (The Press, 23 January).

Dr Shaun Holt said homeopathy was based on “nonsensical” theories, and could venture into the bizarre, with materials used in preparations that included mobile phone radiation, whale song and dog testes.

The research showed 59 percent of women and 59 percent of people living in rural areas believed homeopathy was scientifically proven. Under 30-year-olds (37 percent) and Asians (35 percent) were less inclined to believe that this was the case.

UMR Research Director Gavin White said it seemed likely many New Zealanders understood the term ‘homeopathy’ to include a much broader range of natural remedies.

Holt agreed with this explanation. “In general people don’t know what it is. They get it confused with naturopathy. It’s not just members of the public it’s doctors as well.”

However, he would fall short of banning homeopathy. He said homeopaths often had long consultations with patients which made them feel good.

### **Earthquake adds to ‘hypersensitivity’ problem**

A Christchurch woman who claims to suffer from something called electromagnetic hypersensitivity has been sleeping out of doors because of repairs in her earthquake-damaged street (The Press, 17 February).

Anne Gastinger has symptoms including migraines and insomnia, which she attributes to electromagnetic waves and allergies to a range of substances, including treated wood. The symptoms worsened in April last year when overhead powerlines were installed because of damage to underground cables.

Her house had been adapted to avoid triggering the allergies and she hoped to relocate it because it was undamaged. However, covenants on new subdivisions and no policy on buying back houses from the Government made that unlikely, she said.

She rarely spoke about the condition because it was not an acknowledged diagnosis in New Zealand, although a Christchurch GP had provided a medical certificate confirming her symptoms.

In an article on the Organic NZ website in 2010, Anne Gastinger wrote that “leading scientists” claim wifi poses potentially serious health hazards, and that children are the most vulnerable in our community. “Opponents of wifi believe that from the moment it is switched on an odourless, invisible, silent, energetic form of air pollution is introduced into our environment.”



This photo could show a plant that has been watered with water heated on a stove (then cooled), and one with water that has been microwaved, but how could you tell? In fact, it was set up using two plants dug out of the garden a few minutes previously; the one on the right was briefly put in a toaster oven. Photo: David Riddell.

#### From Page 9

remain convinced that some sort of giant ape-like creature prowls the Pacific Northwest.

With such ample historical evidence about photographic manipulation, it's surprising how few people question the authenticity of a series of photographs being circulated on the internet purporting to show the results of a student's science fair experiment. The pictures depict plants supposedly watered either with microwaved water, or with water that has been heated on a stove top. And guess what! The microwave-watered plants wither while the others flourish!

One can come up with all sorts of possible explanations for the difference. Was the soil the same in the two plants? Were they given equal amounts of water? Could they have been exposed to different lighting conditions? Was there some difference in the seeds? But how about a simpler possibility? Fraud. It

isn't very hard to set up two plants side by side and ensure that one thrives while the other dies. Just water one and not the other. Of course the possibility that this is the way the pictures were created does not prove the case.

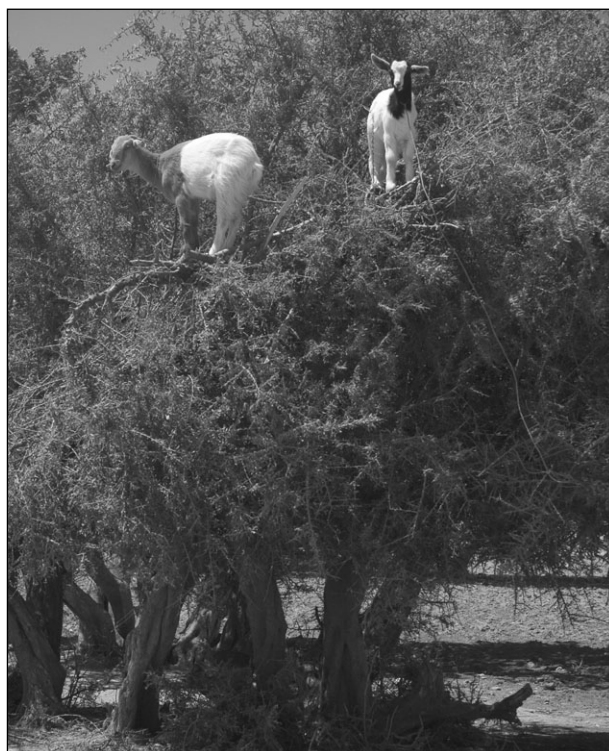
Heating water in a microwave oven does nothing other than raise its temperature. Any talk about "the structure or energy of the water being compromised" is plain bunk. But absurdly implausible

arguments don't prove that the pictures are fraudulent either. What proves it is the good old standard of science: reproducibility. Or lack of.

I did the experiment. I watered plants with microwaved water, kettle-boiled water, and stove-top boiled water, feeling pretty silly about it, but I did it. The results? As expected, no difference. I didn't take any pictures because, after all, how would you know that they are not faked? So here is the choice. You can take my word that the experiment cannot be reproduced, accept that science tells us that microwaves do nothing to water

other than heat it, or take at face value some pictures in a circulating email that purport to show an effect that has eluded scientists around the world but was discovered by a student pursuing a science fair project. Better yet, do the experiment yourself!

As you might guess, I don't believe in spirit photographs, fairies, Bigfoot or plants succumbing to the evils of microwaved water. And I would have put goats that climb trees into the same 'unbelievable' category. But I would have been wrong. It seems that some Moroccan goats have learned to climb the argan tree in search of its olive-like fruit. Legend has it that the undigested seeds that pass through the goats used to be collected and pressed into "argan oil," a traditional food flavouring. Highly questionable. The oil, also used in the cosmetic industry, is actually pressed from fruit that has been picked by human hands, making the tree-climbing goats a



Goats in a tree: some improbable photos really are genuine. Photo: Marco Arcangeli.

nuisance. Still, one can appreciate their remarkable athleticism. Easy to find pictures of their exploits on line. And pictures don't lie? Right?

Joe Schwarcz is the Director of the Office for Science and Society at McGill University in Montreal. This article is reprinted with permission from his column in the *Montreal Gazette*, *The Right*

Chemistry. In November 2011 he visited New Zealand to attend conferences in Hamilton and Christchurch.

alternative cancer therapy

# Just why is 'pioneering' cancer treatment so expensive?

Siouxsie Wiles

*A heartstring-tugging appeal in the NZ Herald doesn't tell the full story.*



**J**ESSE Bessant is a little boy from Auckland with a very rare brain tumour. He has a ganglioglioma, a tumour that arises from ganglion cells in the central nervous system. As these tumours are very slow-growing, and with the location of his tumour (close to his brain stem) making surgery very risky, Jesse's doctors have advised a 'wait and see' approach. However, the Bessant family have opted instead to try the Burzynski clinic in Houston, Texas, where Dr Stanislaw Burzynski offers his 'pioneering' antineoplastin treatment.

The catch? It's going to cost the Bessants \$375,000 to join one of Dr Burzynski's clinical trials. The family's fundraising appeal was covered by the *NZ Herald* in early March under the headline: "Hope for toddler with rare tumour".

So what are antineoplastins and why is a clinical trial at the Burzynski clinic so expensive? Let's start with those 'pioneering' antineoplastins. Might they be the next big thing in the treatment of cancer? I'm afraid to say that this is unlikely, as it turns out that Dr Burzynski has been trialling antineoplastins for over 35 years and has never produced strong evidence that his approach actually cures patients or increases their chances of long-term survival.

In fact the results of his trials don't seem to have been published in the peer-reviewed medical literature and the American Cancer Society has gone so far as to recommend that people don't spend their money

on antineoplastin therapy. Dr Burzynski coined the phrase to describe a group of peptides that he identified first in human blood and then in urine and which he claimed to be "natural, non-toxic compounds that cure cancer".

It turns out that the peptides can also be made by the body metabolising the drug sodium phenylbutyrate, which is how Dr Burzynski has been administering them for several decades now. Rather alarmingly, each 500 mg tablet of sodium phenylbutyrate contains approximately 62 mg sodium, meaning there is considerable risk of side effects including lethargy, weakness, irritability, seizures, coma and even death.

So if antineoplastins are just the by-product of sodium phenylbutyrate, why are Dr Burzynski's clinical trials so expensive? After all, patients don't usually have to pay hundreds of thousands of dollars to join a clinical trial. Sometimes they might even be reimbursed for taking part!



It turns out that Dr Burzynski doesn't just treat patients with his 'antineoplastins' anymore. Instead, he seems to be exploiting a very legitimate trend in real cancer therapy, often referred to as personalised medicine. Here patients are tested for particular disease markers which have been shown to respond to specific therapies. Orac, of the Respectful Insolence blog, has described Dr Burzynski's "Personalized Gene Targeted Cancer Therapy" approach as "throwing everything but the kitchen sink" at the tumours. In fact, Dr Burzynski's personalised therapy is part of a complaint against him by the Texas Medical Board, which is currently awaiting a hearing date. The complaint describes Dr Burzynski's treatment of a patient with metastasised breast cancer, which included prescribing sodium phenylbutyrate with another four very expensive immunotherapy agents, none of which are approved for the treatment of breast cancer, and in combination with a chemotherapy agent.

In fact, it also transpires that Dr Burzynski owns the pharmacy that supplies the drugs he prescribes. His pharmacy is also accused of overcharging for drugs. A former patient, Lola Quinlan, has filed a lawsuit, claiming Dr Burzynski swindled her out of nearly \$100,000 by using false and misleading tactics, including charging \$500 per pill for drugs that could be bought elsewhere for a fraction of that price. And as well as the cost of drugs, there are his consultation fees, listed on one potential patient's blog as:

- Review of medical records

prior to commencing treatment – \$500

- Initial consultation appointment – \$1,000

- "Genetic Tumor Markers" test – \$4,000

- Monthly treatment fee (with treatment suggested to last 4 to 12 months) – \$4,500 - \$6,000

All of which might explain why Dr Burzynski lives in a mansion with his initials in gold on the gates!

But none of this was covered in the *NZ Herald* article. Don't those being asked to donate deserve to know where their money is going? Instead, my

## education

# School of thought

*Adam van Langenberg gives practical suggestions on how to run a high school skeptical society, based on his own successful experience.*

IN late 2010 I was fortunate enough to see noted US skeptics Rebecca Watson and Brian Dunning speak at the La Notte restaurant in Melbourne. As entertaining as these talks were, what really grabbed my attention was local skeptic Richard Saunders' demonstration of the Power Balance scam. The more he demonstrated, the angrier I became. Angry because I'm a high school teacher and a lot of my students (and a few of our teachers) were wearing these things. Five minutes earlier I didn't even know what they were; I had assumed they were

emails to the journalist remain unanswered and Letter to the Editor unpublished. And the Bessant family continue to raise funds to send their child to be treated by a man who is accused by the Texas Medical Board of "unprofessional or dishonorable conduct that is likely to deceive or defraud the public or injure the public". Pioneering? More like profiteering, if you ask me.

**Siouxsie Wiles is a microbiologist and bioluminescence enthusiast who heads the Bioluminescent Superbugs Group at the University of Auckland. She can often be found blogging about miscellaneous science and skeptical issues on Sciblogs and ranting about pseudoscience on the Completely Unnecessary Skeptical Podcast (CUSP).**

one of those charity bands you see everywhere. Now my protective instincts were kicking in and I wanted to help my kids from getting sucked into this scam.

At school the next day I showed several of my classes the applied kinesiology techniques the salespeople were using. The students thought the tricks were very cool and a lot of embarrassed bracelet wearers suddenly started justifying their fashion choices:

"It was a gift!"

"I found it on the footpath!"

Mostly, though, they stopped wearing them.

The success of this led me to create the McKinnon Secondary Sceptical Society. We meet once a week and spend our lunch hour discussing specific pseudosciences, critical thinking techniques and debating the merits of scepticism. A brief speech at a school assembly brought over 100 students to the first sessions (a mass Zener ESP experiment) but numbers are now more stable with 20 - 40 kids on average.

One of the things that has surprised me about the group is how young most of the students in it are. By far, the majority are in year 7 and 8. I typically have around 20 students at those levels each week and about 5 - 10 from other year levels. I was a little worried that this might lessen the amount of deep discussion we could have but, as you'll read later, I needn't have been.

Favourite topics so far have included three weeks on logical fallacies and a month spent teaching the children how to cold read. I may have created some monsters here because they turned out to be quite gifted at it.

I truly believe that critical thinking and scepticism belongs in our school's curriculum. Until that day comes, we are relying on teachers to inject it into their classrooms themselves. Unfortunately I don't see a lot of this. I know at least one science teacher who fervently believes that aliens have been landing on the Earth for many years and I worry about how many of their students have been taught to believe this.

I think that a sceptical society is the next best thing, as it brings the concept of scepticism into the community. People refer to me as "Mr Sceptic" (and occasionally "the dream crusher") and many students and teachers have approached me for my thoughts on various ideas. "Sceptical" is now a word being used more and more at my school. My ultimate goal is to have every student understand what scepticism is and just how rewarding it can be.

I have spent a lot of time thinking about what I consider to be important when running a group like this. What follows are my ideas.

### **Make the sessions fun and relevant**

Hopefully this one is a no-brainer. Children can have very short attention spans and if they're not enjoying themselves, why would they continue? They're forced to be in my maths classes so I can be as boring as I like but the sceptical society is totally optional. This is why I try to make my talks funny. It's why I throw in as many jokes as I can. If you're being funny, kids will listen because they want to hear the next joke. And if you can sneak in a bit of good stuff between the jokes they'll probably learn something too.

There are plenty of fun activities around the internet that you can run. There's an ESP experiment on the JREF site and Richard Saunders has videos up of water dowsing and 'can you tell if somebody is staring at you?' experiments. There are lots of astrological ideas as well, such as having astrological descriptors up around the room and

asking students to try to guess which one is theirs. Activities like this can be real drawcards and get kids coming along who might not have ordinarily been interested.

That's a key point – a 'sceptical society' probably won't draw a huge crowd, but an experiment to see if anybody is psychic probably will.

Relevancy is also very important. We talked about Power Balance bands because all of the kids knew about them. They'll all be aware of psychics, aliens and ghosts so those are topics that come up a lot. The vaccine debate probably isn't at the front of their minds and it doesn't come up as often, but it does come up occasionally and you'll be pleased to know that the anti-vaccination mindset makes them very angry.

It's important to follow the news and select the things that you think will interest them.

### **Don't make it a science club**

Be aware that to most teenagers 'science' means sitting in a classroom while a teacher talks about a bunch of boring stuff. You might get to do the odd experiment but there often isn't that sense of mystery and beauty that we know science is all about.

So when I say don't make it a science club, what I really mean is don't make it an obvious science club. Sneak the science in. Make it a club about ghost hunting and astrology debunking and homeopathy ridiculing. While you're doing that, briefly explain how you could use this thing called 'single blinding' to make an experiment. Then

maybe throw in some ‘double blinding’ to show them how to make it better.

The next thing you know, your kids have learnt a bit of science and they’ve learnt why it’s important. If you’ve done your job right they’ll also have learnt why it’s just so damn cool.

### **Probably don’t make it a secular club**

A few people from the sceptical community have gotten upset with me about this, some suggesting that if I’m not actively turning my students against religion then I’m basically wasting my time. Let me explain why I think this is a bad idea.

First of all, I think it’s a really fast way to get yourself shut down. Sure, a lot of schools have Christian, Muslim and Jewish societies so you could argue discrimination if you came under attack but I don’t think you’d get very far. Sometimes it only takes one angry phone call from a parent to get something cancelled.

More importantly, you don’t want to exclude religious people from your group. A lot of the kids who come along to my club are Christian or Jewish. The last thing I want is for them to feel unwelcome. I steer clear of religious topics for that reason alone. If somebody brings up testable religious claims (such as creationism) I’m always happy to discuss them, but I will never make them the focus of the session.

A lot of my children come from very religious families, who could quickly make a complaint and ban their kids from

turning up. My kids all know that I believe in the big bang and the theory of evolution. My kids also know that I can have a respectful conversation with them about it, even if they disagree with me. There are plenty of other topics out there worth discussing.

### **Prepare to be asked about anything**

One day I had an entire session planned around psychics. About five minutes in, a kid asked me if I thought it was alright to tell little kids that Santa exists.

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### **Don’t assume that kids can’t handle ‘grown up’ topics.**

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Normally I would have told them to wait until the end but most people in the room seemed genuinely interested in my answer. This answer turned into a conversation about the history of Santa, the philosophy of lying and funny Santa stories.

Should I have stopped the discussion and gone back to the psychics? Absolutely not. I knew I could always talk about psychics next week. Children’s minds are so inquisitive and always on the go. The most surprising things can interest them without warning. Go with it. The trick is to have as much knowledge as you can on many different topics. Being a specialist in a particular field is great, but it doesn’t really help when running something like this for kids. In my position, it is better to know a little about a lot of topics, rather than vice versa. Of course, the more I know about as much as possible, the better I can do my job.

### **Don’t dumb things down**

If there’s one thing that never ceases to amaze me about children, it is their almost unlimited capacity for impressively inventive cruelty. If there’s one other thing, it’s how much they actually understand. A couple of months ago a boy in my class started talking about transvestites. He wanted to know whether all transvestites were gay. A few others responded by suggesting that some of them probably are but not all of them. What followed was a wonderfully respectful and inquisitive classroom discussion. I sat back and watched, marvelling at how mature and understanding they were being. What really impressed me was that these children were 12.

Don’t assume that kids can’t handle ‘grown up’ topics. Medical minutiae might go over their heads but it doesn’t mean that they can’t ponder the issues involved. Want to talk about the ethics involved in prescribing placebos? They can handle it. Want to discuss terminally ill people reaching out to alternative medicine as a last resort? Go for it, just be prepared to handle some potentially delicate questions.

### **Children are easily influenced, so influence wisely**

Children pick up everything, from diseases to attitudes. I don’t like angry, condescending adults so I don’t want my kids turning into them. We all know that you don’t change people’s beliefs with ridicule and personal attacks, so why start developing those habits in kids now?



When we discussed homeopathy, some of my students started laughing at people who use it. Obviously, anybody who believes in homeopathy is an idiot and deserves to be ridiculed. I don't blame them for thinking this way because they are still very young, but it needed to be stamped out immediately. What if the patients were referred to a homeopath by a GP? What if

they have no idea how it works? What if they're at death's door and are desperately trying something different as a last resort?

If you teach kids to look down on victims of pseudoscience, you are teaching them to be insensitive and arrogant. Kids need to understand that all people should be treated with respect and that everybody is worth listening

to. Unless, of course, they're a filthy scumbag con-artist who is knowingly ripping people off. In that case, go right ahead and tear them a new one.

**Adam van Langenberg teaches maths and scepticism at McKinnon Secondary College in Melbourne. This article was originally published in the Australian Skeptic.**

forum

## Sex abuse article missing content?

I'VE just been reading my Summer 2012 edition of *New Zealand Skeptic*, but I think there is a piece missing from my version.

On page 15-17 there is an article by Gordon Waugh that is missing both a chunk of text and his references. There is clearly a gap between the first section which ends with "it caused mental injury" and the next which starts with "Do sexually assaulted people exhibit ...". In the later section he talks at length about the lack of a defined 'syndrome' caused by sexual abuses. This doesn't make any sense unless there is a paragraph on why the 'mental injury' should be a 'syndrome' in order to be real. There's no specific 'falling off a ladder' syndrome, either, but I wouldn't argue that that means people aren't injured in falls. Without Mr Waugh's explanation of why he is using this narrow definition of 'mental injury' his argument becomes ridiculous.

I'm also concerned that his references have been lost. He talks about what counsellors believe and think, but the survey

or research that backs this up is missing. I find it hard to believe an author calling for ACC to demand testable evidence in relation to sexual abuse cases would fail to provide the evidence to back up his own assertions. He also talks only about counsellors, and I assume that the section of his article that deals with what it means to be an ACC registered counsellor is also missing. Without it, it looks as though anybody can set themselves up and start referring patients for claims. This is obviously absurd and without the missing section Mr Waugh's credibility takes a serious knock.

Perhaps these could be printed alongside part two of this article, which I assume will be covering the legislative aspects. Mr Waugh refers twice to laws that are being broken, but never actually sets out which statutes these are. He also calls for the criminalisation of ACC claims that fail to provide "proper evidence" of sexual abuse and I assume he will talk more about how "proper evidence" is defined and how it would be collected. And how its collection will be consistent with the evidence required by other types of injury.

Renee Maunder

## Peppering is back

Not possums ... rabbits!

I was horrified to see a Country Calendar this morning (made in 2011) where the increase in rabbits was being discussed. One of the farmers said he had been told to shoot a rabbit, skin it, burn the skin, and scatter the ash in order to have the desired effect. He just hoped the rabbits would go elsewhere! He admitted his other farmer friends were doubtful but were waiting to see what happened. He said he was four weeks into the trial but that positive results might not show up until at least six weeks.

Well, this might work if he shot lots of rabbits to get the skins to burn ... shooting would remove a few.

Else I have this mental picture of hundreds of little bunnies all sitting in Easter baskets and madly paddling away back to England...

Louette McInnes  
Christchurch



# Have universities degraded to teaching ‘only’ scientific knowledge?

*Alison Campbell considers the current state of tertiary education.*



THE title for this article is taken from one of the search terms used by people visiting my ‘other’ blog, *Talking Teaching*, which I share with Marcus Wilson and Fabiana Kubke. It caught my eye and I thought I’d use it as the basis of some musings.

We’ll assume that this question is directed at science faculties. Using the word ‘degraded’ suggests that a university education used to provide more than simply a knowledge base in science.

(If I wanted to stir up a bit of controversy I could say that it’s just as well that they ‘only’ teach scientific knowledge, however that’s defined. My personal opinion is that the teaching of pseudoscience, eg homeopathy, ‘therapeutic touch’ etc, has no

place in a university, and it’s a matter of some concern that such material has appeared in various curricula in the US, UK and Australia, among other countries. Why? Because it’s not evidence-based, and close investigation – in one case, by a nine-year-old schoolgirl – shows that it fails to meet the claims made for it. You could teach about it, in teaching critical thinking, but as a formal curriculum subject? No way.)

Anyway, back to the chase. Did universities teach more than just ‘the facts’, in the past? And is it a Bad Thing if we don’t do that now?

I’ll answer the second question first, by saying that yes, I believe it is a Bad Thing if all universities teach is scientific knowledge – if by ‘knowledge’ we mean ‘facts’ and not also a way of thinking. For a number of reasons. Students aren’t just little sponges that we can fill up with facts and expect to recall such facts in a useful way. They come into our classes with a whole heap of prior learning experiences and a schema, or mental construct of the world, into which they slot the knowledge they’ve gained. Educators need to help students fit their new learning into that schema, something that may well involve challenging the students’

worldviews from time to time. This means that we have to have some idea of what form those schemas take, before trying to add to them.

What’s more, there’s more to science than simply ‘facts’. There’s the whole area of what science actually is, how it works, what sets it apart from other ways of viewing the world. You can’t teach that by simply presenting facts (no matter how appealingly you do this). Students need practice in thinking like a scientist, ‘doing’ science, asking and answering questions in a scientific way. And in that sense, I would have to say that I think universities may have ‘degraded’.

Until very recently, it would probably be fair to say that the traditional way of presenting science to undergraduates, using lectures as a means of transmitting facts and cook-book labs as a means of reinforcing some of those facts (and teaching practical skills), conveyed very little of what science is actually all about. And it’s really encouraging to see papers in mainstream science journals that actively promote changing how university science teaching is done (eg Deslauriers et al, 2011, Haak et al, 2011, and Musante, 2012).

Of course, saying we've 'degraded' what we do does make the assumption that things were different in the 'old days'. Maybe they were. After all, back in Darwin's day (and much more recently, in the Oxbridge style of university, anyway) teaching was done via small, intimate tutorials that built on individual reading assignments and must surely have talked about the hows and the whys, as well as the whats, of the topic du jour.

However, when I was at university (last century – gosh, it makes me feel old to say that!) things had changed, and they'd been different for quite a while. Universities had lost that intimacy and the traditional lecture (lecturer 'transmitting' knowledge from up the front, and students scrabbling to write it all down) was seen as a cost-effective method of teaching the much larger classes that lecturers faced, particularly in first-year.

In addition, the sheer volume of knowledge available to them had increased enormously, and with it, the pressure to get it all across. And when you're under that pressure to teach everything that lecturers in subsequent courses require students to know before entering 'their' paper, transmission teaching must have looked like the way to go. Unfortunately, by going that route, we've generally lost track of the need to help students learn what it actually means to 'do' science.

Now, those big classes aren't going to go away any time soon. The funding model for universities ensures that. (Although, there's surely room to move

towards more intimate teaching methods in, say, our smaller third-year classes? And in fact I know lecturers who do just that.) But there are good arguments for encouraging the spread of new teaching methods that encourage thinking, interaction, and practising a scientific mindset, even in large classes. Those papers I referred to show that it can be done, and done very successfully.

First up: there's more to producing a scientifically literate population than attempting to fill students full of facts (which they may well retain long enough to pass the end-of-term exam, and then forget). We need people with a scientific way of thinking about the many issues confronting them in today's world. Of course, we also need a serious discussion at the curriculum level, about what constitutes 'must-have' knowledge and what can safely be omitted in favour of helping students gain those other skills. (This is something that's just as important at the level of the senior secondary school curriculum.)

And secondly: giving students early practice at doing and thinking about science may encourage more of them to consider the option of graduate study, maybe going on to become scientists themselves. In NZ graduate students are funded at a higher rate than undergraduates, and the PBRF system rewards us for graduate completions, so there's a good incentive for considering change right there!

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**Alison Campbell is a lecturer in the Biological Sciences Department at Waikato University. She writes Bioblog as a way of encouraging critical thinking, looking at scientific papers that are relevant to the Level 3 curriculum and Scholarship, and fielding questions from readers.**

natural health

## 'Natural Health Bill' nothing of the sort

THE submission by the government's science advisor Sir Peter Gluckman on the Natural Health Bill makes interesting reading, particularly his comments on the bill's title.

"It is unfortunate that the Bill has progressed so far with such a misleading title. The use of 'natural' draws on the naturalistic fallacy that what is found in nature is somehow better – even though many 'natural products' are highly toxic. Yet paradoxically, Section 20.1 of the Bill and Item 4 of the associated schedule provide that a 'synthetic equivalent' may be declared as a 'natural health product ingredient'. The use of 'health' also carries the presumption of proof of effect, which for many of these products will not exist. This may become important and misleading to the public if labelling or advertising were allowed to imply that product notification is equivalent to approval under the Act."

(Hat tip to Keith Garratt.)

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