SKEPTICISM ■ SCIENCE ■ SOCIETY

THE SKEPTIC

Vol. 32, No 1. March 2012

+ MEDICAL MIRACLES

The End of the World & Cat food

EDUCATION & Critical Thinking

The search for Cold Fusion

Skeptics investigate claims of clean energy

Australian Skeptics ■ www.skeptics.com.au

Skeptical Groups in Australia

Australian Skeptics Inc – *Eran Segev*
www.skeptics.com.au
PO Box 20, Beecroft, NSW 2119
Tel: 02 8094 1894; Mob: 0432 713 195; Fax: (02) 8088 4735
president@skeptics.com.au

Sydney Skeptics in the Pub – 6pm first Thursday of each month at the Mezz Bar, Coronation Hotel, Park St in the city (meeting upstairs)

Dinner meetings are held on a regular basis.
Next dinner- Prof John Dwyer on Friends of Science in Medicine, March 31 - Bookings online or contact nsw@skeptics.com.au

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Hunter Skeptics Inc – *John Turner*
Tel: (02) 4959 6286 johnafturner@westnet.com.au

Meetings are held upstairs at The Cricketers Arms Hotel, Cooks Hill (Newcastle) on the first Monday of every month, except January, commencing 7.00pm, with a guest speaker or open discussion on a given topic. Visitors welcome. Further information from the secretary at: kevin.mcdonald379@bigpond.com

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Australian Skeptics (Vic) Inc – *Terry Kelly*
GPO Box 5166, Melbourne VIC 3001
Tel: 1 800 666 996 vic@skeptics.com.au

Skeptics' Café – Third Monday of every month, with guest speaker. La Notte, 140 Lygon St. Meal from 6pm, speaker at 8pm sharp.

More details on our web site www.skeptics.com.au/vic

Borderline Skeptics Inc – *Russell Kelly*
PO Box 666, Mitta Mitta, Victoria 3701
Tel: (02) 6072 3632 skeptics@wombatgully.com.au

Meetings are held quarterly on second Tuesday at Albury/Wodonga on pre-announced dates and venues.

Gold Coast Skeptics – *Lilian Derrick*
PO Box 8348, GCMC Bundall, QLD 9726
Tel: (07) 5593 1882; Fax: (07) 5593 2776
lderrick@bigpond.net.au
Contact Lilian to find out news of more events.

Queensland Skeptics Association Inc – *Bob Bruce*
PO Box 3480, Norman Park QLD 4170
Tel: (07) 3255 0499 Mob: 0419 778 308 qskeptic@uq.net.au

Hear Bob on 4BC Paranormal Panel - 9-10pm Tuesdays

Meeting with guest speaker on the last Monday of every month (except December) at the Red Brick Hotel, 81 Annerley Road, South Brisbane. Dinner from 6pm, speaker at 7.30pm.

Canberra Skeptics – *Michael O'Rourke & Pierre Le Count*
PO Box 555, Civic Square ACT 2608
http://www.canberraskeptics.org.au Tel: 0417 253 044
mail@canberraskeptics.org.au (general inquiries),
arthwollipot@gmail.com (Canberra Skeptics in the Pub).

Monthly talks usually take place on the 13th of each month at the Innovations Theatre at the ANU. Dates and topics are subject to change. Canberra Skeptics in the Pub gather at 1pm on the third Sunday of each month at King O'Malleys Pub in Civic. For up-to-date details, visit our web site at: www.meetup.com/SocialSkepticsCanberra/

Skeptics SA – *Laurie Eddie*
52B Miller St Unley, SA 5061
Tel: (08) 8272 5881 laurieeddie@adam.com.au

Thinking and Drinking - Skeptics in the Pub, on the third Friday of every month. Contact nigeldk@adam.com.au
www.meetup.com/Thinking-and-Drinking-Skeptics-in-the-Pub/calendar/10205558 or http://tinyurl.com/loqdrt

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WA Skeptics – *Dr John Happs*
PO Box 466, Subiaco, WA 6904
Tel: (08) 9448 8458 info@undeceivingourselves.com
All meetings start at 7:30 pm at Grace Vaughan House, 227 Stubbs Terrace, Shenton Park
Further details of all our meetings and speakers are on our website at www.undeceivingourselves.org

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Australian Skeptics in Tasmania – *Leyon Parker*
PO Box 582, North Hobart TAS 7002
Tel: 03 6238 2834 BH, 0418 128713 parkerley@yahoo.com.au
Skeptics in the Pub - 2nd Monday each month, 6.30pm, Ball and Chain restaurant, Salamanca Place, Hobart

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Darwin Skeptics – *Brian de Kretser*
Tel: (08) 8927 4533 brer23@swiftdsl.com.au

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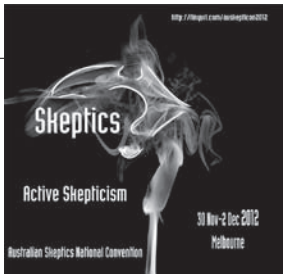

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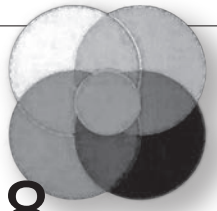

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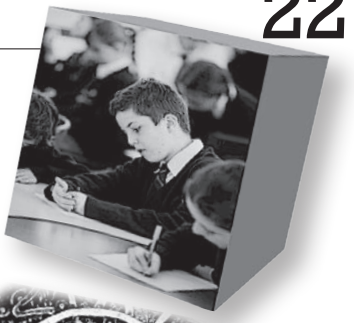

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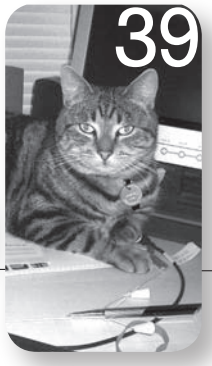

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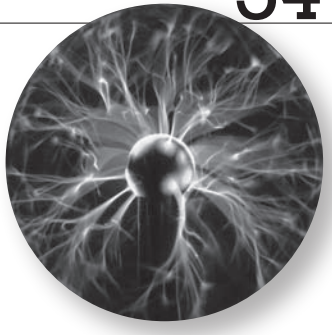

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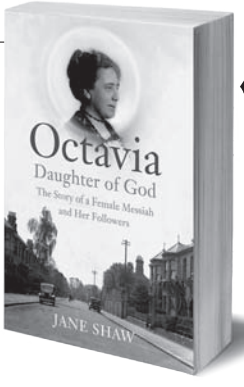

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Skeptics

Tertiary industries

A recent announcement caught my eye.

It seems the University of Woolloomooloo has established a degree course in Astrology. This will be a three-year course, with the first covering all aspects of the science of astrology, including basic concepts of horoscopes, the ecliptic, the zodiac, sun signs and the relativity of constellations to the terrestrial environment, aspects, the sidereal and tropical approaches, with a special one-day course on the precession of the equinox. Emphasis will be placed on the importance of the seven planets, as well as looking at alternatives such as a heliocentric model. This program will include a short two-day course on astronomy.

Philosophical underpinnings, including Hermeticism, will form the basis of year two, covering the harmonisation of the different astrological systems: Assyrian, Persian, Babylonian, Western, Islamic, Chinese, Mayan and Callithumpian.

The final year will cover the application of astrology – how to prepare charts, advanced character assessment, computer and business skills, and the importance of industry associations to your practice.

To ensure that all graduates have the correct skills, quality standards and required industry ethics, the degree program will be overseen by the Australian Association of Astrologers. This will assure authorities, scientists, skeptics and clients that all graduates will have the correct bona fides and skills to prepare accurate and complete individualised charts.

There may, at a later date, be an additional short component covering research into the scientific principles and the physics of solar, lunar, planetary and stellar influence on terrestrial individuals and events, and the accuracy of astrologers' predictions and character assessments, although this does not seem necessary at the present time.

Impressed?

This is the same argument – "let the industry manage it, even if it's a load of piffle" - used by the complementary and alternative medicine industry in the face of criticism of universities running disproven or unproven courses in medical (and other) areas. This view was expressed particularly strongly following an initial campaign by the newly-formed Friends of Science in Medicine group, which received much publicity and support.

The majority of the anti-FSM response has been, frankly, hysterical, and along the lines that FSM is trying to wipe CAM off the university calendar, using terms like "censorship", "freedom of speech", "they're trying to silence the competition". Unfortunately, from my point of view, there has not been enough said to counter the argument that FSM wants "any mention of CAM in unis stopped".

I think what FSM and others are (and should be) saying is that "We are not concerned with individual research which investigates claims associated with such topics. Our concern is with courses that actively promote such methodologies - through education courses at whatever level - as being valid and proven, when the truth is often quite the opposite." This puts the emphasis back on the science and not the politics. That is, it's not "how it is applied" but rather "does it work?" I think that's a pretty easy concept for the public to grasp, and a reasonable one.

It's interesting to note that Charles Sturt University has issued the following preamble to the description of its Bachelor of Health Science (Complementary Medicine) course:

"[CSU] is keen to recognise these concerns and highlight the difference between our course and many courses offered by other universities. CSU does *not* teach homeopathy, iridology, reflexology or any other subjects that are not based on experimental evidence."

So what are the "other universities" doing? ■

- Tim Mendham, editor

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Around the traps… AVN

AVN wins court case … but denies having influence on vaccination

Martin Hadley reviews the curious case of the organisation with no influence on anybody.

By ironically denying that its anti-vaccination activities had any effect on people, the AVN has successfully achieved the dismissal of two complaints against it. Supreme Court Justice Christine Adamson ruled late last month that the NSW Health Care Complaints Commission should not have proceeded with the complaints made in 2009 because there was no evidence submitted that anyone was influenced by the AVN.

The complaints were that the AVN engaged in misleading and deceptive conduct. The HCCC examined the AVN website and found in 2010 that it did include misleading and deceptive content. This judgement does not attack those findings. It does not endorse the AVN. It confirms that the AVN still comes under HCCC scrutiny.

The HCCC operates under legislation which filters the kind of complaint that it can deal with. The Judge held that these two complaints crossed a fine line and lay outside the HCCC's capacity (or "jurisdiction"). However, the judge did not find that the AVN was generally outside jurisdiction, even though the AVN had tried to achieve that result.

The case turned on a fine distinction – the difference between these two situations:

1. Something has caused detriment to a patient; and
2. Something has a tendency to cause detriment to patients, but a specific instance has not been identified.

The complaints which the HCCC had upheld were type 2, but the HCCC could only consider type 1. It was an ironic result. The AVN hopes that people who receive its 'information' will decide against vaccination. Vaccination rates are lower in areas where the AVN is most active. They plead for funds to continue their campaigns. However, we now see what happens when it suits the AVN to argue that no-one can prove that anyone has actually followed its advice. To a lawyer, a technicality produces an emotion like watching the other soccer team score an own goal – we'll allow it.

THE NON-EDUCATING EDUCATOR

Equally pragmatic was how the AVN argued that it was not involved in health education. This would have avoided HCCC sanction on another technicality. The AVN goes to great trouble to reach out and contact people. What is it that it tries to do if not educate them? Does it seek to have no effect on these people? Does it seek to mis-educate them? The Court did not buy this, with the result that the AVN can be the subject of further complaints.

With or without glory, the AVN got its finding that the two complaints under consideration were outside HCCC jurisdiction. Argument then focussed on the ramifications. Back in 2010, the HCCC had required the AVN to put a disclaimer on its website. It disobeyed, so the HCCC took the unusual step of publishing this warning to the public about the AVN's 'true colours': "The AVN's failure to include a notice on its website of the nature recommended by the Commission may result in members of the public making improperly informed decisions about whether or not to vaccinate, and therefore poses a risk to public health and safety."

The AVN claimed that it lost charitable fundraising status because of how the Minister for Gaming reacted to that warning. The AVN now wanted the warning "quashed" (a legal term equivalent to the Daleks' "ex-ter-min-ate") in the hope that the Minister would then reverse his decision.

The Court did not see the ducks lining up that way and refused that remedy.

The decision is likely to provoke mixed reactions. It gives the benefit of the doubt to the class of 'health service providers' who can be the subject of complaints. Since this is legislation that is intended to protect the public, a different approach could have been taken. There may be an appeal.Meanwhile the ruling indicates the kind of complaint which the HCCC can deal with in future, about the AVN or similar bodies.

NHMRC delays advice on homeopathy

The country's leading medical research body, the National Health & Medical Research Council, reportedly needs another 18 months to come to a decision whether it is unethical for health professionals to advocate homeopathy.

Last year, Dr Rachael Dunlop commented on a draft version of the Council's NHMRC position statement [*The Skeptic*, Vol 31:2, p8]. She said that she was pleased see the draft calling homeopathy "unethical" and "shown not to be efficacious".

"This is the first time the Australian government has made such an unequivocal statement about the pseudoscience of homeopathy," she said.

However, according to *Australian Doctor* magazine (there is no announcement on the NHMRC's website), the Council now says it needs to conduct a "comprehensive literature search to supplement its review [to] ensure that all relevant research is included and that appropriate consultation can occur". A Homeopathy Working Committee will oversee the work, with the expectation it will produce an official position statement by June 2013. ■

Friends in high places

Tim Mendham reports on the launch of Friends of Science in Medicine

There are two apparent movements at the moment in tertiary education, and both are in conflict but form two sides of the academic coin.

One is the growth of university courses, including some degree courses in medical areas, that are of dubious scientific validity, to say the least. Such courses were covered in two articles in The Skeptic last year (31:1 and 31:2), and include homeopathy, reflexology, naturopathy, acupuncture, Chinese herbal medicine and chiropractic.

The concern expressed in those articles was that "under the imprimatur of universities and their reputation for academic probity and accuracy, the public, students and no doubt many academics would regard these areas of activity as having been endorsed by such institutions."

This is the view taken up by the newly formed Friends of Science in Medicine (FSM).

Launched late last year, FSM is part of the growing movement by academics and others to call such courses to account and for institutions to stop carrying courses for which there is no scientific basis.

Loretta Marron, who was named the Skeptic of the Year in both 2007 and 2011 (the only person to win the award twice), has been instrumental in the establishment of FSM.

She says that the recent announcement of a chiropractic science degree by Central Queensland University (CQU) was the kick-off point for the formal movement, with 34 scientists, doctors and community advocates writing to the university's Vice Chancellor and Health Science Deans voicing their concern. The group made its disquiet public in various forums and its concerns received wide media attention as a result.

"Although we targeted the CQU in our initial campaign because of their proposed chiropractic course, we strongly support rigorous scientific assessment of alternative medicine claims by university scientists in all institutions. Ours is a broader campaign that aims to reverse the current trend which sees government funded tertiary institutions offer courses in health care science that are not based on scientific principles or supported by scientific evidence."

FSM is intended to draw together members of the scientific and academic community to "create an organisation of basic and clinical scientists, doctors, clinical academics and informed consumer advocates who share our concerns. We hope to provide the strong voice of reason and credibility required to help the public make an informed choice in choosing their medical care and not be subjected to false claims of efficacy or the unnecessary risk of harm from any unproven therapy be it conventional or 'alternative'.

"We also hope to generate some influence on those in government and elsewhere who are responsible for funding such courses and decide what alternative practices are eligible for medical benefit refunds or private health insurance payments."

From the initial 34 members, the list of those supporting FSM has grown to more than 500, including past Australians of the Year Prof Ian Frazer and Emeritus Prof Sir Gustav Nossal.

The organisation has written to all Australian universities, asking them to endorse the principles that science and health courses offered by universities should be evidence-based and conducted according to accepted scientific methodology.

"Our main goal is to have all universities acknowledge this controversy and review their health science teaching to ensure that their courses use scientific principles based on experimental evidence," said Professor Alastair MacLennan, Professor of Obstetrics & Gynaecology at The University of Adelaide.

Prof MacLennan is one of five key players in FSM, the others being Loretta Marron; Emeritus Prof John Dwyer AO, UNSW, founder of the Australian Healthcare Reform Alliance, clinical advisor to and member of the NSW inter-agency committee for the protection of the public from health care fraud; Prof Rob Morrison OAM, Professorial Fellow, School of Education, Flinders University (and winner of the Skeptics' Eureka Prize in 2002); and Prof Marcello Costa FAA, Professor of Neurophysiology, Flinders University.

The group's activities have raised the hackles of the complementary and alternative medicine industry, with the claim being that FSM is trying to clean universities' offerings of alt med elements entirely. Marron denies this is the case, saying that it is the responsibility of the universities to ensure that areas they teach and research are in line with notions of scientific legitimacy.

"If alt med areas warrant research and further investigation, then that's fine. But if such topics are found wanting, then the teaching of them should be stopped, as universities would do with any pseudoscience."

Morrison adds that teaching "about" these topics is fine, "but there would be less objection if these patently pseudoscientific courses were not given the banner of 'science'."

FSM can be reached at scienceinmedicine@bigpond.com. A website will be launched soon. ■

Randi for 2012

Melbourne – November 30 to December 2

National Convention

The annual convention of Australian Skeptics will be held in Melbourne this year, with James "the Amazing" Randi one of the guest speakers.

The convention will be held at the SPOT Theatre, Economics and Commerce Building, University of Melbourne, from Friday, November 30 to Sunday, December 2. The first day will be the usual meet-and-greet cocktail party in the evening, followed by two very full days of speakers, panels, entertainment and *bon homie.*

The theme of the convention is "Active Skepticism - changing for the better". According to the Victorian Skeptics, who are organising the event, "Active skepticism embraces the growing national and international movement that recognises simply being a Skeptic is not enough. In order to achieve a more rational and equitable world we need to actively promote a skeptical view of the world – and we think that would lead to a change for the better!"

James Randi last visited Australia for the 2010 convention, and this welcome return promises to kick off a great event.

Other speakers confirmed so far are:

- DJ Grothe (USA), president of the James Randi Educational Foundation, writer, public, blogger and podcaster.
- Rebecca Watson (USA), the original Skepchick, blogger and podcaster returns to Australia.
- Dr Ken Harvey, winner of the 2011 Australian Skeptics Thornett Award for the Promotion of Reason and crusader against an ineffective TGA and shonky products marketed to gullible consumers.
- Lynne Kelly, author of *The Skeptic's Guide to the Paranormal*.
- Dr Rachael Dunlop, vice president of Australian Skeptics and when not researching heart disease writes such things as the *Skeptics Book of Pooh-Pooh.*
- Richard Saunders, one of the most recognised skeptical faces in Australia, author, founder and podcaster on *The Skeptic Zone.*

- Dr Krissy Wilson, studying anomalous psychology at Charles Sturt University.

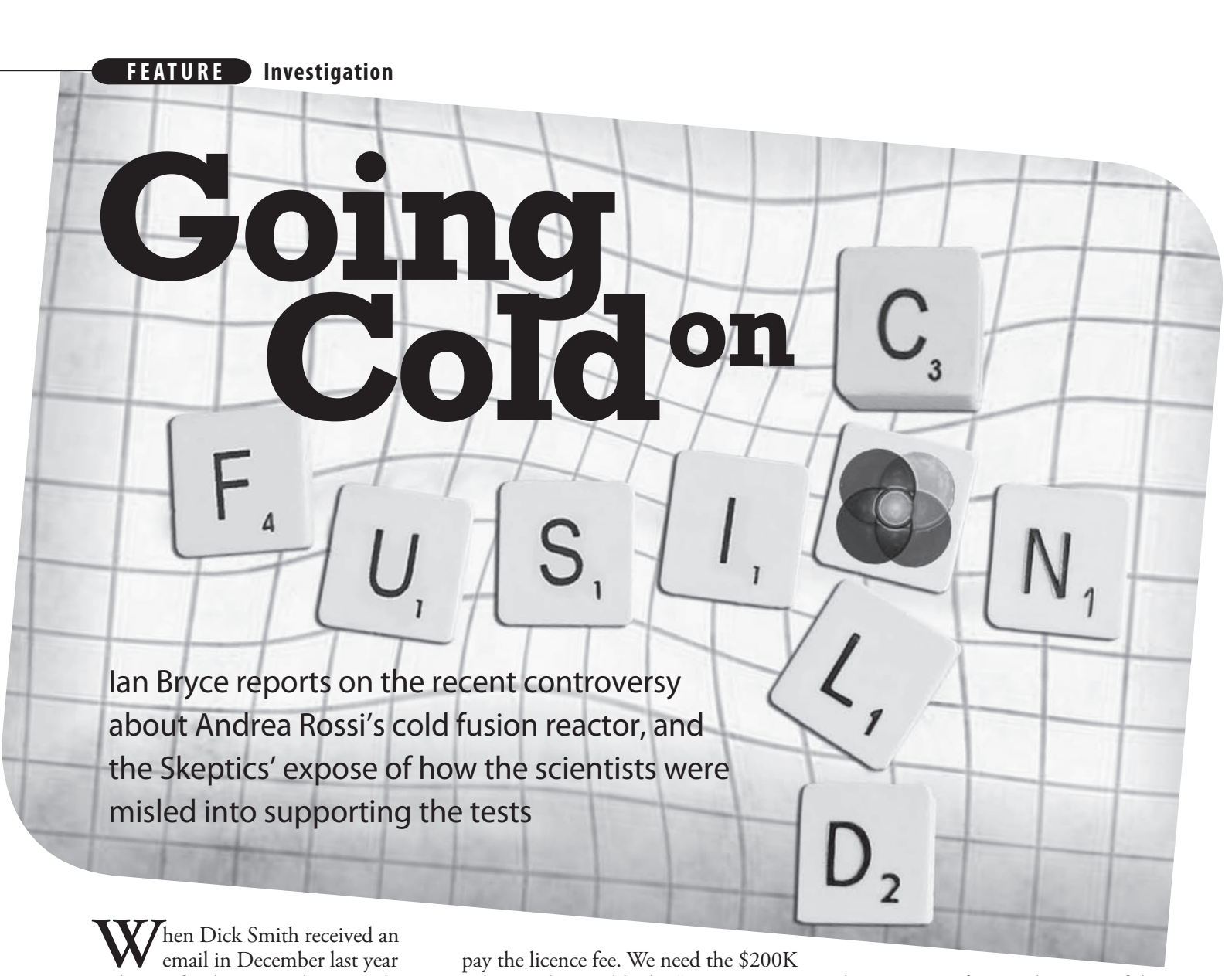
There are other speakers to be confirmed, plus a range of activities with the emphasis on fun, including the Bent Spoon award, a special Twitter Zone, skeptical interludes, strolling minstrels, skeptical trivia and Randi magic - with the real Randi doing the magic!

Registration for the convention will be $280 (full) and $220 (concession). There will be a separate charge for the convention dinner ($110) to be held at Melbourne Arts Centre on the Saturday night. **Subscribers to The Skeptic will get priority booking from May 26, 2012, with general registration opening on June 2.** The Vic Skeptics point out that places are strictly limited. And, as if you needed any further incentive, the first 100 registrants will receive a free convention T-shirt or polo shirt.

All in all, we expect it to be a great conference and one not to be missed.

Further information is available at http://tinyurl.com/auskepticon2012.

Going Cold on



Ian Bryce reports on the recent controversy about Andrea Rossi's cold fusion reactor, and the Skeptics' expose of how the scientists were misled into supporting the tests

When Dick Smith received an email in December last year with an offer that seemed too good to be true, Dick naturally thought it might be just that. Sol Millin from Byron Bay wrote "Cold fusion is now a commercial reality, and will replace dirty fossil fuel, coal, oil and gas and deadly uranium as the world's new clean green power. This is a highly lucrative trillion dollar market opportunity," he added, as if the solution to the world's energy and pollution problems was not enough.

Sol continued "Rossi's Cold Fusion is a commercial reality with 14 x 1Mw plants already sold in the USA and Europe to groups such as NASA and DARPA [the major Defence research agency] and commercial companies. The E-Cat in essence delivers power with no fuel input over a period of 20 years!

"We have been negotiating with [Italian entrepreneur] Andrea Rossi for many months, and the contracts have been agreed and I am scheduled to fly to Bologna Italy to sign the agreement and pay the licence fee. We need the $200K risk capital to enable this."

Sol had written to many Australian businessmen, asking for a $200,000 investment. Dick, the only one to respond, immediately replied "If I invented such an incredible machine, I would make sure I would get a simple report from someone who is quite independent to say that it actually works. Can you send me a copy of this and I will send off the cheque?"

So it was with some surprise that Dick soon received a report by two Swedish nuclear physicists who witnessed a test on 29 March 2011. Sven Kullander is professor emeritus of high energy physics at Uppsala University, and a member of the Royal Swedish Academy of Sciences and chairman of its Energy Committee. Hanno Essen is an associate professor of theoretical physics and a lecturer at the Swedish Royal Institute of Technology and, of great interest to the readers of this magazine, former chairman of the Swedish Skeptics Society.

This team had analysed the measurements, and concluded "Any chemical process for producing 25 kWh [total energy over 6 hours, not power] from any fuel in a 50 cm3 container can be ruled out. The only alternative explanation is that there is some kind of a nuclear process that gives rise to the measured energy production."

Sol sent Dick the invoice he had received from Rossi giving details of a bank account in Florida where 100,000 Euros was to be transferred. Dick immediately sought the help of Australian Skeptics (which Dick was instrumental in founding in 1980).

Thus I began investigating, and uncovered a total of 15 scientists and engineers who had either witnessed a test or analysed the results, and gave some support for Rossi's device called E-CAT (energy catalyser) or for low

energy nuclear reactions (LENR) in general. Brian Josephson, Nobel Laureate said "This is capable of, by itself, completely changing geo-economics, geo-politics, and solving climate and energy." Three NASA scientists gave various words of praise including "It is my professional opinion that the production of excess energy has been demonstrated when the results of the last 20+ years of experimentation are evaluated."

REACTOR TEST SETUP

What had the scientists seen? The photo shows a typical setup with the two Swedish scientists with Rossi. They are looking at a small 'reactor' where cold fusion is claimed to occur. It has several wires running from a blue box, which is plugged into a regular Italian 230V power outlet. The power from the mains is monitored by voltmeter and ammeter, and gives (on this occasion) 345 watts of input electrical power. The blue box has been inspected and contains several power phase controllers (the industrial equivalent of light dimmers) with control buttons – certainly no batteries or other source of power.

Water is pumped into the bottom of the reactor and, after 15 minutes warm up, the supposed nuclear reaction sets in and a steam-water mixture issues from the reactor via a hose to a drain. The temperatures are monitored – in this case 18C entering and 100C exiting.

Rossi calculated the power generated assuming only steam out, which gives 4.7 kilowatts, showing a CoP (coefficient of performance) of 14. Several commentators have questioned this claim, but I calculate that even if only 10 per cent of water is vaporised, the power is 1020 watts giving a gain of 3.0. This situation prevailed for over six hours, which rules out hidden batteries, phase change materials, chemical reactants etc.

A similar setup with some variations was used in at least seven tests up to April 2011, with most showing a significant power production (under the most pessimistic assumptions). This resulted in all those observers supporting excess energy which they attributed to a hitherto unknown source such as cold fusion.

SOL MILLIN

I reported to Dick that I could not see any flaw, and set out to Mullumbimby to attend a meeting of prospective investors organised by Sol. A highlight was to be a Skype hookup to Rossi in Bologna, and I prepared some questions.

Sol turned out to be a retired IT consultant with a science degree. He drives a 1980's Camira, painted hippy style with Love and Peace, and numerous flowers.

Sol is also a devotee (his word) of Indian mystic and proven scammer Sai Baba. In fact, Millin wears a "gold" ring with a huge 10 mm green "diamond", which Baba supposedly materialised out of thin air and slipped on Sol's finger – and Sol has never removed it. How does he know it's a real diamond? Because Baba said so! Born David Millin, he asked Baba for a mystical name, and Baba said "Solihin", which Millin kept.

Sol has an organisation called Byron New Energy Charitable Trust, in which he has peddled woo such as the Cosmic Water Cell which energised ordinary H2O so your car can run on water (goodness knows why he then needs Rossi's E-CAT). Sol firmly believes researchers can grow back missing limbs and transmute elements, but the technologies are being suppressed.

I asked Sol what would happen if he passed millions of investors' dollars to Rossi and it eventually did not work? He said there is no need for concern, he will personally guarantee their investments. I thought, that would be sad, because he might have to sell his 1985 Camira to repay them.

> "I could not see how Rossi's E-CATs regularly produce excess power under the noses of skilled observers."

Several people commented that if Rossi has cracked cold fusion and is seeking an Australian representative, why he is dealing with a retired hippy in New Age-land, instead of a major energy company.

MULLUMBIMBY MEETING

The demographic in Byron and Tweed shires is interesting. I realised that the Bryon area is perhaps the centre for woo in Australia, with the lowest vaccination rate. However there is plenty of retired money there, as evidenced by the literature in coffee shops – on one table the *Financial Review*, *The Age* and *Sydney Morning Herald*, and on another leaflets for a 'Mardi-Grass' and an Earth Frequencies Festival. I asked what this latter meant, and the response was a surprised "Don't you know of Tesla's work in making the earth resonate like a bell?"

The meeting was advertised in the local papers, repeating the mantra of "This is your chance to take part in the golden age of humanity" and "We are the people we have been waiting for".

It attracted about 70 people. Sol gave a long Powerpoint presentation which summarised the scientific support for E-CAT. It will change the world and "remember where you were when history was made".

He was seeking the Australasian licence in Rossi's business, and Rossi (who frequently denies seeking money) was demanding 100,000 Euros by the end of January.

Sol's slides described a home-sized E-CAT like the one pictured, and an industrial-sized one in a shipping container which produces one megawatt, and listed prices for both. He strongly urged the audience to invest in BNE, and they would make squillions within a year.

The hook-up with Rossi did not eventuate due to a failure to coordinate times, so I could not ask my questions.

As I represented Sol's main prospective investor, he allowed me to make a presentation. I warned him what I planned to say, and he allowed me to go ahead.

I started off by describing Australian Skeptics and their history. I listed several recent investigations and

Cold Fusion

Continued...

campaigns, including Power Balance, homeopathy, Lutec free energy, and our support for Ken Harvey's battle with Sensaslim.

When I got to the AVN and Meryl Dory, there were howls of complaint, and someone walked out (and later wrote an angry letter).

I asked the audience about their belief in the laws of physics. About 10 per cent thought the laws are correct, 10 per cent thought they are all wrong, and then several explained in the following terms: "Most of us think the laws are OK as far as they go, because we see working cell phones and aeroplanes. But they are incomplete – there is more to be discovered. That is how things like cold fusion might work."

I presented one technical analysis. Previous writers have criticised Rossi's setup for having both water and steam (phase change), thus confusing measurements. So in the March 29 test, I analysed the 15-minute warm-up period during which the input power was apparently 300 watts, before the water started boiling. Transient conditions are harder to analyse, so I had to estimate the amount of copper and water present in the device. Then, using their specific heat, with some assumptions, I estimated the power input necessary to explain the recorded temperature-time data. This shows several plateaus at 690 watts, 1700 watts, and 2600 watts. The power seems to jump suddenly to different levels, which I felt was more reminiscent of switch operation than the supposed nuclear reaction.

An even more puzzling feature of the simulated power output was a moment when the power in the operating reactor suddenly dropped, and 20 seconds later resumed at the higher 2600 W level, despite the reactor having cooled down – hardly consistent with a nuclear reaction being triggered by heat. All this was cause for concern regarding the validity of the LENR claims.

Left: Andrea Rossi (left) proudly displays his E-CAT fusion reactor to Swedish scientists Prof Sven Kullander (centre) and Assoc Prof Hanno Essen (right).

I described my three-legged stool test for claims of a scientific nature:

- Firstly, there needs to be a theory in which it is at least possible – but despite many claims of exotic new physics, none has explained how cold fusion could overcome the Coulomb Barrier.
- Secondly, there must be observations or measurements showing the phenomenon really occurs. With Rossi'e E-CAT, there are too many signs that something is wrong experimentally, despite the many supportive scientists.
- Thirdly, the claimant must be credible – and Rossi has allegedly already sold energy devices which failed to work (thermoelectric cells), spent time in jail for environmental crimes and tax fraud (layer acquitted), and cited a degree in chemical engineering from a bogus university.

I told the audience that a new phenomenon becomes sound when all three of the above legs are solid. If one leg is broken, like a stool it falls down – and remains unproven until better evidence is obtained. In this E-CAT case, all three legs have severe problems. This makes it very unlikely that it is worth pursuing at all, and I would be recommending against investment.

Questions from the audience followed. They were divided between energy science and investment structures. Some were very knowledgeable about bush technologies, while others asked for the latest on far-out energy schemes.

The latter included Brown's Gas (a magical mixture of hydrogen and oxygen), the Joe Cell (a collector and accumulator of orgone energy), Steven Horvath's hydrogen fusion car (claimed to run on water), and nascent hydrogen (a method of using atomic hydrogen to achieve extremely high temperatures).

The next morning I reported to Dick that although I still could not see how Rossi'e E-CATs regularly produce excess power under the noses of skilled observers, there were too many bad signs for it to be real. We both reported to the waiting media, and got much press coverage

.

THE LENR COMMUNITY & ROSSI

In fact, "cold fusion" is an older term for the energy source claimed by Fleischman and Pons in 1998. Their experiment was never replicated, and yet they still have a band of dedicated followers. The technology which is now called "low energy nuclear reactions" (LENR), and which 'works' on a somewhat different principle to overcome the repulsive Coulomb barrier between two positively-charged nuclei which normally prevents fusion from occurring except in the presence of very high temperatures.

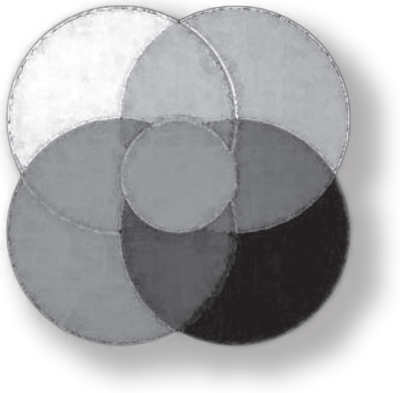
There is a plethora of websites and blogs devoted to discussing LENR, some more breathlessly than others.

COLD FUSION – HOW IT 'WORKS'

Steve Novella describes the technical issues around claims of cold fusion low energy nuclear reactions.

Fusion occurs when like-charged atomic particles – like protons, or atoms of protons and neutrons – are forced together under great temperature and pressure so that they fuse together to make a larger atom. The electromagnetic repulsion of the like charges has to be overcome and the particles brought close enough together so that the nuclear forces will take over and fuse them together. For elements lighter than iron, fusion results in an excess of energy, and for elements heavier than iron energy has to be put into the system for fusion to occur.

Nuclear fusion is what powers the sun – right now, mostly hydrogen being fused into helium. Fusion bombs work by using a fission bomb to force a pellet of nuclear material together with sufficient force to cause fusion.



The basic concept is that some form of confinement is needed to force the protons together. Stars use gravitational confinement – their immense gravity pushes the hydrogen together until it fuses, and hold it together despite the outward explosive force of the energy created by fusion. Fusion bombs use inertial confinement created by the fission explosion. But there can also be magnetic confinement where strong magnetic fields force the charged particles together.

The limiting factor in all of these scenarios is that extreme force must be used to force fusion to happen. This is great for creating a bomb, but not for a sustained controllable reaction where the energy can be harnessed. Engineers are working on creating hot-fusion for energy, but the engineering challenges are extreme.

COLD FUSION

Thus the allure of cold fusion. If we could somehow cajole hydrogen atoms, or some other light element, to fuse together without the extreme activation energy needed for known methods of confinement, we could theoretically have a low energy nuclear reaction – LENR or cold fusion. This would be easier to control and harness. Nuclear reactions result in vast amounts of released energy, so such a source could be abundant. The process would not generate any greenhouse gases or radioactive waste. Hydrogen as a fuel source could be harvested from water.

The only problem is that so far there is no evidence that anyone has been able to do it. There have been many claims, even beyond the high profile claims of Pons and Fleischmann in the 1980s, but they all suffer from the same problem – lack of reproducibility.

PROBLEMS

Cold fusion claims tend to take the form of Pons and Fleischmann's – a laboratory setup that seems to produce a bit of excess energy, often in the form of heat. The claim for nuclear fusion is mainly based upon an argument from ignorance – there is a bit of unexplained energy in the experiment, therefore that energy is coming from nuclear fusion. This is the same logic used to argue that an unidentified light in the sky is a flying saucer, or an unexplained blob of light on a photo is a ghost.

There are two problems with this line of evidence. The first is that it is easy to miss a subtle source of energy. Basing a claim on the inability to explain a tiny bit of energy is inherently weak – even the tiniest error or oversight could explain the results, and tiny errors and oversights are common. Only through rigorous replication designed to eliminate, as much as possible, any such errors or oversights would a cold fusion claim be compelling, and so far no such claims have survived attempts at replication.

The second problem is the absence of positive evidence for fusion specifically as the source of the unexplained energy. If hydrogen is being fused into helium, then helium should be detected. This process also produces neutrons, tritium, and gamma rays. So far no experiment claiming excess heat from cold fusion has been able to document the simultaneous presence of helium, neutrons, tritium and gamma rays in sufficient quantities to what is predicted should occur if fusion is the cause of the excess heat. Some researchers have claimed finding these things in excess of background levels, but just barely, and still orders of magnitude less than predicted. So again, slight experimental error is a better explanation.

CONCLUSION

As far as I can tell, we are nowhere near achieving cold fusion, which may not even be possible. Justifications for cold fusion at present are purely speculative. I have no problem with companies or individuals dedicating their time and resources to researching cold fusion. I think it is prudent to invest a small amount in research into unlikely claims that are at least possible and would have a huge payoff.

But we do need to be cautious. If the basic science does not point the way to a plausible solution, then diverting funds from basic science to translational problem-solving research is likely to be counterproductive. With regard to cold fusion/LENR, it seems to me (as an outside lurker and not a nuclear physicist) that the basic science is not here, and no one knows if it ever will be. ■

Dr Steve Novella is an academic clinical neurologist at Yale University School of Medicine. He is the president and co-founder of the New England Skeptical Society, and host and producer of The Skeptics' Guide to the Universe podcast. This article is adapted from his Neurologica blog - http://theness.com/neurologicablog/index.php/cold-fusion-after-20-years.

Cold Fusion

Continued...

You can search for relevant sites using "Rossi", "Bryce" or "Dick Smith" to find relevant threads. They range from the serious – *oilprice.com* – to the "There's nothing too far out" *Above Top Secret*.

The many followers of LENR in general are divided into those who support Rossi, such as *Mats Lewan's Ny Teknik Swedish technology magazine*, and those who don't believe in Rossi, such as Steven Krivit's *New Energy Times*.

There are many insinuations of conspiracies involving competitors, governments, vested interests and other media people and bloggers. One regular correspondent even keeps raising UFOs as an ancillary concern, as if the two topics are linked, much to the chagrin of others.

Rossi graduated cum laude in Philosophy of Science and Engineering from the University of Milan in 1973. His thesis was on the philosophy of Albert Einstein's Theory of Relativity.

He has been a vigorous entrepreneur, having invented a process to convert organic waste into oil for which, in 1978, he founded a company named Petroldragon and built many such reactors.

Rossi also invented a thermoelectric generator intended to turn waste heat into electricity, but reports say the units delivered failed to work. Thus there are conflicting reports of his background.

EUREKA!

Dick insisted there must be a trick involved in the E-CAT demonstrations, so I spent some time going over all the reports. I have learnt from the Skeptics' contacts among magicians that scientists are easy to fool, and can overlook what is under their noses.

The 29 March test could be separated into two phases – transient (warm-up) and steady state. The warm-up phase has been described above, with powers in the range 690-2600 W being required to account for the temperature rate of increase.

For the steady-state phase, there were many videos showing steam issuing from the outlet hose. Analysis already published on the internet often concluded that the steam quality was not measured properly, and so "there are no valid measurements".

I looked more closely at the observations, and tried to find upper and lower limits – a minimum of 1023 W being produced in steady state for 6 hours, compared to the a maximum of 345 W input shown on power metering. This indicates a CoP (coefficient of performance or power gain) of at least 3, thus supporting Rossi's claims. Where could the extra power be coming from, if not cold fusion?

> "They did not ask why the internal wiring was such a rat's nest, when it should have been simple and easy to trace out."

Then at 3:53am on January 19, being unable to sleep, the earth wire technique came to me in a Eureka moment.

I got up and checked it quickly against the observations and data – it fitted. The new hypothesis also seemed to explain the observed power production in all seven tests of the 10 and 3 KW machines (up to April). (After that, Rossi's techniques changed, and in the 27 KW machines, a misplaced thermocouple explains the energy gain.)

To understand the hypothesis, it is necessary to describe the layout. One difficulty in investigating the claims has been the lack of equipment setup diagrams from Rossi, which would be normal practice for any sound demonstration. Often the observers at each demonstration have drawn up their own understanding of the layout.

Scientists and journalists observing the demonstrations were shown inside a blue box. This is the control box for the input power, and the observers noted that there were many wires between it and the reactor, making it impractical for observers to measure the power directly to the reactor (at least until June).

Instead, they were forced to measure it in the power lead to the blue box.

The blue box contained several phase-operated power controllers, which are the industrial equivalent of the common light dimmer. Perhaps they wondered why such a basic 'reactor' warranted any such devices, let alone twelve, most of them unconnected. They also did not ask why the internal wiring was such a rat's nest, when it should have been simple and easy to trace out.

Some of the observers saw standard measuring instrumentation, such as an ammeter, for measuring the current from the electricity mains. A photo shows that the cable from the power plug has the three coloured wires which are standard colours around the world, and every engineer and electrician will recognise. The brown wire is active, at 230 volts, and carries the current to the load. The blue wire is neutral, at zero volts, and carries the return of the load current. The green and yellow striped wire is the protective earth, and connects to the metal enclosure (if any) of the load device.

The earth wire normally carries no current. However, should there be an insulation breakdown in the appliance, the earth wire returns the fault current to the wall outlet, and hence the building's earth stake (usually blowing the fuse or tripping the circuit breaker), thereby protecting humans using the appliance from electric shock.

In the illustrations and videos of several tests, the clamp of an ammeter is shown looped around the brown wire, thus measuring the current in the active. On 29 March this current was reported to be 1.5 amps. When multiplied by the voltage between active and neutral, 230 V, this yields the power travelling from the wall outlet to the load (if it is a simple resistive load) as 345 watts. The power reaching the E-CAT must be slightly less due to control and instrumentation.

Thus the observing scientists interpreted what they saw according to the layout in Figure 1.

THE EARTH WIRE HYPOTHESIS

The evidence suggests to me that Rossi had arranged to sneak extra electrical power into the E-CAT, which the observers would not measure. The earth wire is suitable for this task if, say, the connections were rearranged slightly both in the power plug (or perhaps wall outlet), and also inside the blue box. Refer to Figure 2.

In this hypothesis, 230 volts is applied to the green and yellow earth wire. Inside the blue box, several power controllers (call them "B") are reconnected to this wire, and convey unmetered power to the reactor.

Such wires will carry about 13 amps continuously without any visible signs of heat, and thus provide up to 2900 watts of extra power. This is ample to explain the observed boiling of water and generation of steam in the demonstrations.

The clamp ammeter is still showing the 1.4 amps in the brown wire, which powers the "A" controllers. It does not register the 12 Amps flowing in the green wire next to it, because it is not threaded through the clamp. Similarly, the 13 amps returning through the neutral wire is not detected.

Possibly the hot wiring is done inside the wall outlet instead of the plug. The result would be the same.

But does this theory explain the facts?

In my investigations, I firstly examined all seven published tests of Rossi's E-CAT from December 2010 through April 2011, which include models known as the 10 KW, the 3 KW, and the 3 KW truncated*. Such a misconnection could funnel in up to 3000 watts, rather than the 300 – 800 watts shown on the meters. Since the output power estimated in these experiments ranges from 2300 to 2900 watts (after careful corrections and some estimation), all the excess power previously attributed to cold fusion is accounted for.

In the 14 June test, the input power was approximately 800 W, and the output may have been 800 – 3000 W, so energy gain was not proven. In all the tests after July of E-CATs known as the 27 KW and the Megawatt models, there was no valid output power measurement due to poorly placed thermometers and other errors, and hence no proven extra power.

Could there be other explanations? The site http://lenr/qumba.com by Alan Fletcher, and other sites, go into infinite detail to examine and disprove theories including: dual water circuits; embedded phase change materials; the use of hydrogen peroxide instead of water; and microwave power beamed from the next room! I think Ockham's Razor is needed.

Thus, I believe that all results of E-CAT tests are accounted for without involving LENR, and in most cases the earth wire hypothesis is by far the simplest. Physicist Hano Essen agrees that it is possible, given what he observed on 29 March.

What predictions does this hypothesis make? Firstly that all demonstrated output powers (run from a power point) should be less than 3000 W – this seems to be true.

It explains the power 'plateaus' seen

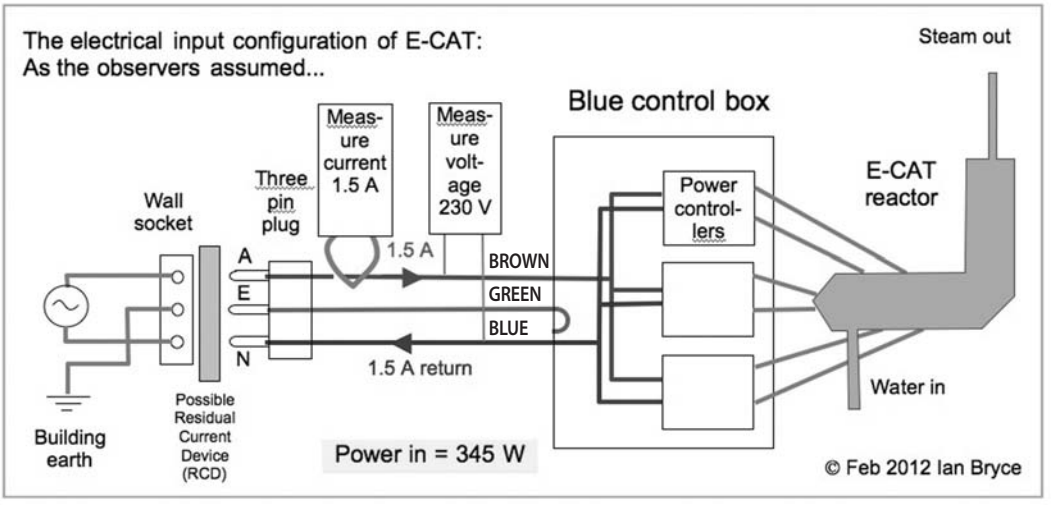


Fig 1: E-CAT wiring as the observers assumed - active (brown), earth (green/yellow) and neutral (blue) wires all in their proper configuration.

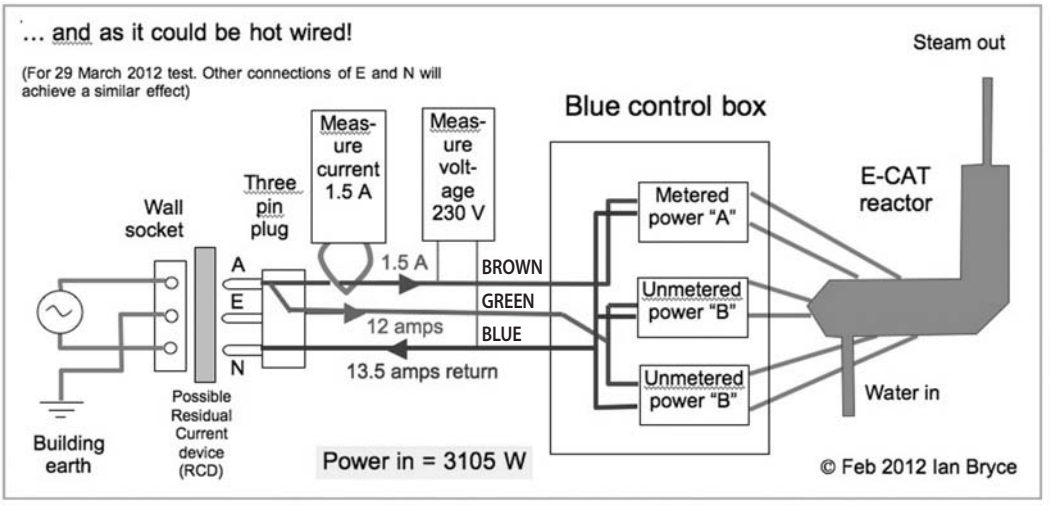


Fig 2: E-CAT woring as it might very well have been - the 'hot wired' version with active (brown) and earth (green/yellow) wires interacting.

Cold Fusion

Continued...

on my simulation of 29 March.

It explains also the 20 second dip in output power – perhaps someone approached the meters and Rossi briefly turned off the B controllers (he tends to sit by the blue box).

We would expect Rossi to resist attempts to have the power plug disconnected. We see this in the 29 March test where a second resistor was required "to initialise the burning and also to act as a safety if the heat evolution should get out of control". In September there is a 'signalling device', and on 6 October test, a 'frequency producer' which cannot be turned off. All of these need to be kept running, so the power plug remains connected. Finally, for the test of the megawatt machine of November, a large diesel generator was kept running the whole time.

THE REACTION

While I was developing my alternative theory, Sol Millin was becoming increasingly impatient with Dick Smith.

He wrote to Dick, threatening him with: "If Byron New Energy Charitable Trust do not obtain the exclusive licence for E-CAT Technology in Australasia from Leonardo Corporation [Rossi's company], we intend suing you for damages of $100,000,000 (one hundred million dollars).

"The only impediment to us obtaining this licence right now is your default of payment of the $200,000 (two hundred thousand dollars) that you owe us by close of business Tuesday 17 January 2012 (tomorrow).

"As an alternative, you may wish to complete your obligation and welcome in the New Energy Age of clean green inexpensive renewable Cold Fusion to Australasia and the World."

Needless to say, there was no obligation on Dick's part to hand over $200,000. He had never indicated he would give the money to Millin without some independent assessment, which I gave him, and which was negative. Threatening to sue for $100 million was a tad excessive, and neither Dick nor Australian Skeptics have heard any more about that.

In late January, my hypothesis was published through a generally issued press release, as well as through direct correspondence with many of the players and bloggers. There was instantly a rush to defend Rossi and the E-CAT by almost all of the bloggers. The test observers themselves, on the other hand, largely remained silent; those I contacted were unable to provide any evidence to the contrary.

We received feedback from many people overseas who listened to a Skeptic Zone podcast that I did, as well as from a separate Australian would-be investor. We also received notification of many other energy scams around the world.

There were queries raised as to Dick's earnestness (even, by some, his very existence) and many references to "pseudoskeptics", by which the writers meant those who reach a negative conclusion based on third party reports.

THE $1 MILLION OFFER

Thus armed with added confidence, Dick then upped the ante by offering Rossi $1 million, with no strings attached, if he could repeat the test in which Kullander and Essen took part.

He said: "I do not want to know how the unit operates, nor to have a share in the profits from any sales. My satisfaction will come from knowing that if the unit is successful, some of the world's greatest problems – especially in relation to climate change – will be solved."

He only wanted the two Swedish scientists (if available) and a third party to ensure measurements and the set-up were correct, to act as his representatives.

Support for this move came in from an unexpected corner. Sol Millin told Dick "Good on you. It looks to me that you have already emailed this offer to dear Andrea? Is this the fact? As you see, I have cc'd this email to dear Andrea. Let's hope dear Andrea Rossi takes you up and all is made crystal clear."

Certainly Rossi's views were made crystal clear.

Within less than 24 hours, he had rejected it, describing the offer as "clownery".

"If this guy wants to test a 1 MW plant and has 1 million to spend he can buy a 1 MW plant, with a regular contract, that gives him all the necessary guarantees and to us the logic financial guarantees. Our plants are tested by Our Customers and the Consultants they choose. I have not time at all for this clownery. Besides: when Our E-Cats will be in the market, this 'millionaire' will have the chance to buy for few hundred dollars an E-Cat and test it as he wants, so why waste money? I do not need his money."

And there it stands. Claim and counter claim, unsupported by any evidence from Rossi.

He says there will be working models of E-CAT for sale by the end of this year. He is apparently moving his operations to Miami.

And what of Sol Millin? The scuttlebutt goes that the licence for the distributorship has gone to someone else. The saga continues.

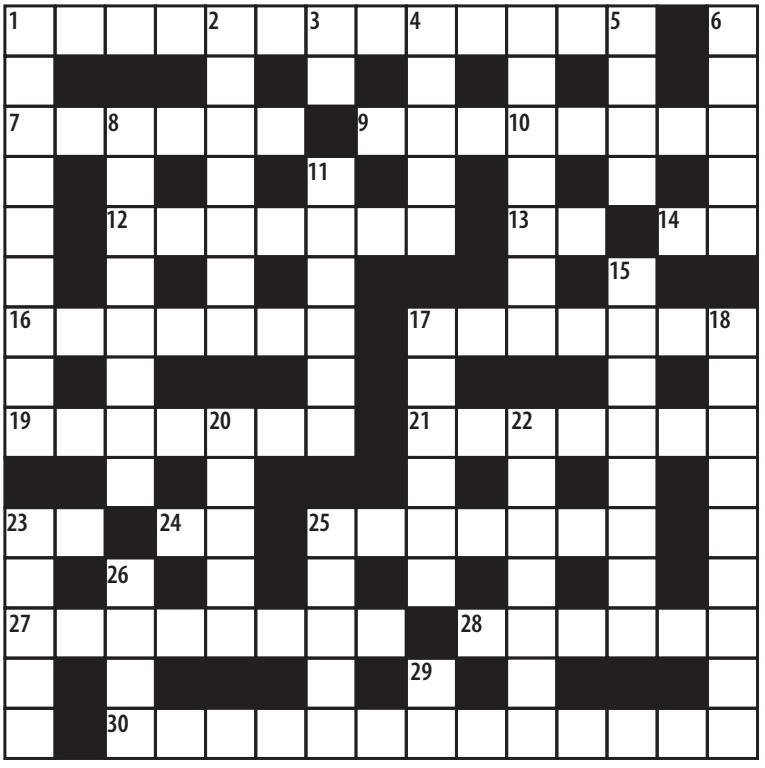
Are there any winners? As well as truth, justice and the Skeptics way, there are the people who would have been lining up to invest their savings into a project that was not yet proven to be genuine. Not to mention the many researchers into real improvements into energy production and utilisation, who will have more investment funds available. ■

**A list of the previous tests on Rossi's E-CAT - and other background material to this article - can be found at http://www.skeptics.com.au/wordpress/wp-content/uploads/Rossi-ECAT-press-release-Technical-31.pdf.*

About the author:
Ian Bryce is chief investigator for Australian Skeptics, as well as a physicist and rocket scientist.

Brain testers

CRYPTIC CROSSWORD no 13



Tim Mendham + Steve Roberts

ACROSS

1. & 7. Stupid and badly singed – that's Creationism! (13,6)
7. See 1 across.
9. Can't stand a mean hat like this. (8)
12. I will start at a monster lake of disease. (7)
13. Once the largest city, today we hesitate to say it. (2)
14. Very old version of British Columbia. (1-1)
16. Shocked appeal to your deity. (2,2,3)
17. Those telling lies add boron to briefs in the wash. (7)
19. Closed system aspect, as per Tony. (7)
21. Standard issue headgear for fearful believers could be a metal enhancer. (7)
23. These days it's a promotion. (2)
24. The subconscious I would be. (2)
25. A victim of brute force, or the forcer? (7)
27. Princess has a posse, as we're bitterly told. (8)
28. Thanks be to those playing air tag. (6)
30. Mailmen's phone involved in a study of sensual evidence. (13)

DOWN

1. Too rare to be beneath Ken. (9)
2. Put your mark on a tree in Filipino. (7)
3. Behold! Fifty and no more! (2)
4. Is it a fungus like the will o' the wisp? (5,6)
5. A lot like a group of players. (4)
6. Vocal Mel's white wine. (5)
8. Marks of a saint confuses the Magi, gratefully. (8)
10. Prick this to attract wickedness, and it's starting to happen using malt beer. (5)
11. Best time to say hello. (6)
15. Quite suggestive that a Communist would have nothing before Easter. (8)
17. See 4 down.
18. Where to grow the sun and collect energy. (5,4)
20. Stranger than a strange queen. (5)
22. Where Leo has trouble with eyes in anger. (7)
23. Join the French and confuse us all. (5)
25. Not allowed to thank a scare. (5)
26. When surprised, hit the gas pedal! (4)
29. This as about a bad queen. (2)

DR BOB'S QUIZ

1. **What proportion of the crimes in Enid Blyton's *Noddy* books are committed by the Golliwogs?**

2. **After the first emperor of China (Ch'in) had the Great Wall built, he was taken to inspect it. Why did his procession of vehicles also carry fish?**

3. **Was the Last Supper a sudden idea, or was it organised in advance?**

4. **The planet Saturn is 120,000 km diameter; how thick are its rings?**

Answers on page 61

Running on Empty?

Peter Ellerton applies some critical thinking to reason, and finds a good reason for thinking critically.
It's just a shame that a lot of others do not.

The defining aspect of these secular times must surely be the call to base our behaviour as a species on evidence-based reasoning, and it's certainly a call you'd expect from a magazine dedicated to examining sceptical issues. On the surface of it, this sounds like the best path to epistemological bedrock, to discover whatever truths may be ultimately discoverable.

For my money this is so, however I suggest it's a path strewn with problems. Not the problems of education and awareness you may think I mean, but problems that will ultimately undermine the sceptical message, because the harder we drive it home the more these problems dig in.

To best illustrate my point, I need only ask "How many people whose behaviour is demonstrably irrational think they are being perfectly reasonable?" People do not think of their behaviour as unreasonable regardless of the outcomes of their actions, indeed we question our reasoning about as often as we question our judgement (which in effect can be the same thing). Imagine if we publically lamented our lapses in effective thinking as often as we did our lapses in memory.

This shows that the understanding of what makes for reasonable thinking is neither clear nor common. It also shows that urging people to reason is as necessary as urging them to breathe - and as purposeless. We all believe our decisions are reasonable ones: who do you know who celebrates their irrationality?[1]

But what about those who clearly eschew the rationality of the scientific world view? Surely they cannot claim to be reasonable? But of course they do. There is nothing so powerful in the philosophy of such people as the belief in their own experiences as foundational to their reasoning. In other words, given their experiences and how they choose to interpret them, they would be irrational to come to any other conclusion than there exists, say, a personal god, spirit guardian, cosmic case worker or spiritual realm free from the constraints of the material world. It's not about whether or not you are reasoning; it's about what you take as a premise and how you move from there.

Here's an analogy. The reasoning process is like a building a house, and while not all houses are equal let's assume that to call something a house credits it with a minimum utility. Without doubt some houses are better able to withstand heavy weather just as better arguments withstand heavy criticism, and while the latter may be a good thing, remember that not all houses are built for the tropics. The foundation of a bungalow is entirely inappropriate for an office block, but it will make someone very happy on the beach. Just as the belief in a deity will not cure cancer but might provide other comfort (yes, I know that doesn't mean it's true). The use of thinner timber here and watery concrete there may indeed be suboptimal, but the house may stand as perfectly functional for its inhabitants.

In similar houses, you will get people who swear by the use of recycled timber and some who prefer bricks. In

this sense one may give more weight to a generalisation in a case where someone else prefers to use an analogy, and which of the two is better may depend on other factors such as the intended purpose of the argument, or the audience at the time.

In terms of reasoning which is clearly illogical I could attempt to use a hinge that opens outwards and put it on a door against a jamb that opens inwards. In this case it simply does not function at all. Similarly, the attempt to put a full spa over the bamboo structures holding up the second storey will result in disaster as surely as presuming that 2 + 2 equals 5. In other words, errors in formal logic or using the worst of the logical fallacies equates to the house not functioning at all.

Remember that I am not suggesting what is the best structure, but just pointing out that many people have built a reason-based edifice for their life, believing whole-heartedly in their own reasonableness, and that their continued existence and happiness in this mode (the longevity of their house) is evidence of their success in doing do. The message of evidence-based reasoning is perfectly assimilated, but the intended meaning is lost.[2]

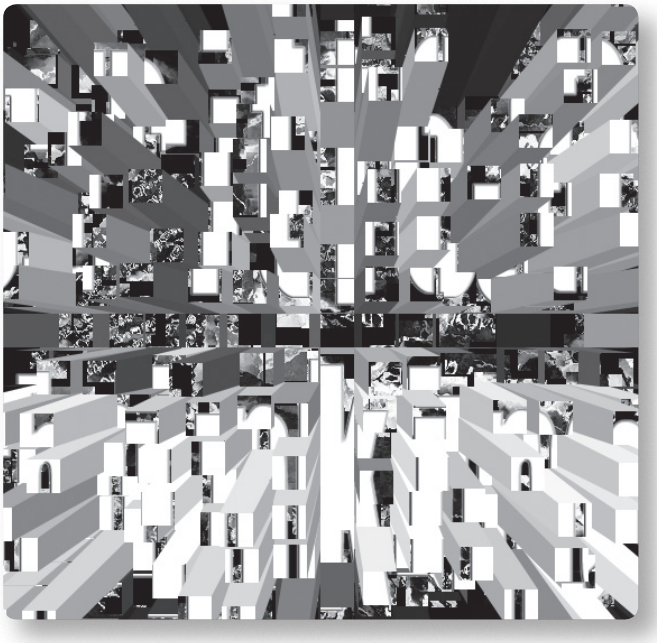
We also have to acknowledge the interplay between reason and evidence – after all, determining what to accept as evidence is a function of the reasoning process. Because of the variation in premise-based reasoning, which is mostly about a variation in premises, we tend to see different things as evidence: I'll show you my graph if you show me yours.

Certain core beliefs will lend themselves to an acceptance of anecdotal evidence over peer reviewed science, others might lead to dismissal of evidence that may have credence, say as some working in the hard sciences feel about sociology or cultural anthropology. There is a spectrum of this behaviour in evidence-acceptance, which is closely linked to belief-formation.

Thinking is not synonymous with reasoning (I may just want a cheeseburger) and reasoning is not synonymous with critical thinking. There are a number of categorisations of thinking that help here.

Some psychologists offer what is called System 1/System 2 categorisation, in which, very simply speaking, the former involves rapid unconscious conclusion-drawing (learned or unlearned) and the latter what we traditionally think of as critical thinking, a slower, more deliberate process.

As an example of a System 1 response, when our mobile phone rings we immediately assume someone wants to speak with us, not that the reception in the area must be OK. A System 2 response would be to consider whether that was a good example of a System 1 response, or whether the reasoning/building analogy was effective. Others save the term 'reasoning' for System 2 thinking alone. It's not really significant here that we define it, but let's be clear about the fact that there are two processes (at least) that we should consider, and that reason may be commonly taken as both, but critical thinking is generally not.



Reasoning, like building, can be done poorly or well. It can make very broad and rapid inferences that can be used to justify positions, at least internally and often without conscious input. Here's a good example. Cognitive dissonance is a process whereby we minimise internal contradictions or tensions by rearranging or even changing our beliefs. If we really want something (say a cheeseburger) and then find out that permission to have one is suddenly withdrawn, rather than coping with the tension of an unstable desire, and perhaps the smugness of the authority figure, we decide that we didn't really want one anyway, so there. Or, in wondering why you stay at your job when you really don't get paid enough, you come to the conclusion that it must be because you love it – tension resolved. This type of reasoning behaviour is not typically conscious.

Critical thinking is a higher order analysis of reasoning. It is a metacognitive (thinking about thinking) process that evaluates the reasons others and we construct and helps create new ones.[3] Of course, this can also be done poorly or well, but we can proceduralise some aspects of critical thinking and hence represent it more manageably than a System 1 process. What is significant is that most people think the use of either system constitutes reasoning, and some think that both constitute critical thinking. Part of the problem is that no distinction is drawn between the two, and that neither really has a commonly understood definition.

> "There is no point just encouraging people to reason, because we all think we do it anyway."

So here's the situation as I see it: there is no point just encouraging people to reason because we all think we do it anyway, and since whether or not we accept evidence is a function of our reasoning in the first place, appeals

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to the epistemic purity of "seek the evidence", with the implied application of reason, are not enough – not wrong, just not enough.

I offer a response in two parts, informed by some new research into argumentation, reasoning and education, which might sharpen the skeptical scalpel a little, or at least make the target clearer. It is not a solution, but suggests a way of operating. The first requires us to understand the purpose of reasoning, and the second how best to do it. Both require something of a paradigm shift, and I'll deal with them more or less at the same time, as they are complementary.

HOW OR WHY WE REASON

Traditionally, reason has been seen as a device for individual truth-seeking. Plato maintained that the use of reason is the defining characteristic of the well-ordered soul. Aristotle developed syllogistic logic to demonstrate how the well-oiled mind should work. Through the philosophic upheaval of the enlightenment into modern academia, individual reasoning has been the measure of all things intellectual. The extent to which the community benefits from the human ability to reason is mirrored by the extent to which individual insight can be shared; and the climb to stand on the shoulders of giants is still lauded as an individual intellectual achievement - despite the protestations of numerous Nobel laureates. The whole notion of the skeptic as an independent thinker and all-round rugged individualist exemplifies the isolation of reasoning as an activity.

Recent work by Dan Sperber and Hugo Mercier, currently enjoying wide interest, has suggested we have this backwards. They offer a theory of reasoning based on supposed evolutionary pressure for the development of 'epistemic vigilance', in effect a way to scan language for veracity. As humans are somewhat unique among animals in that most of our information about our world comes to us from other humans via language, we need a way to ensure we are not being taken advantage of in this conversational flow while at the same time not cutting ourselves off from potentially valuable information. Also, and critically, we need to argue our own case as fully as possible to appeal to the epistemic vigilance of others. Reasoning, they suggest, is inherently associated with language and communication both ways.

They are not the first to claim a reason-language dependence, but they are the first to propose that the reasoning process has evolved to have a social function before all others, including that of isolated reasoning as a kind of DIY truth-seeking. In other words social reasoning, the engagement in argumentation and the promotion of our own positions, is the primary function of this mental ability. This is not to deny the obvious individualistic application of reason, but simply to say it is a by-product, not the primary function, of whatever mental module(s) might exist.[4]

Further to this, they offer evidence drawn from a range of studies showing that humans, to a disturbingly large extent, do not use reason to correct initial errors in thinking, but rather to search for evidence supporting initial (System 1) inferences, correct or not. Worse, it is demonstrably true that humans are in fact rather bad at using individual reason as truth-seeking: not even improving significantly in performance when given time to arrive at a reasoned conclusion.[5] This is exactly what you would expect if the function of reason was not to discover the truth, but to enhance your position among others.

Thus, a whole suite of cognitive biases, not the least of which being the confirmation bias, can be seen not as a flaw in how we reason but as an inevitable consequence of why we reason. If reasoning really was all about each of us finding a correspondence with reality, would we not all be converging on the truth by now? I encourage you to explore the very wide and deep treatment of these ideas, with convincing examples, trials and peer reviews, in the papers suggested.

If true, this theory of reasoning has implications for how we operate in a number of areas.[6] The message of those of us who promote a reasoned, scientific worldview, and the method by which it is delivered, needs to be refined (it also helps explain why our foreheads constantly ache from

pounding them against brick walls).

Courses teaching critical thinking are very often constructed on the premise that if the logical structures of arguments are made clear, and students are taught to recognise and name a range of fallacies, then clear thinking unencumbered by bias and error will be the result. Unfortunately, research does not support such a utopian outcome, and while no one is suggesting such courses are without merit (they have a measurable effect if done in certain ways), there may be opportunities to achieve significant improvements. From the level of political debate to the pedagogies of the classroom there is scope to develop more effective programs and institutions if we think differently.

REASON IN GROUPS

The impressive explanatory power of this theory also reaches into the failures and success of group reasoning. If we are designed to seek justification for our views as a priority, then surrounding ourselves with those of like mind will serve only to reinforce our stance. Each instance of someone agreeing with us is a confirming case for our belief. Our arguments are their arguments, and our epistemic vigilance is relaxed. Ideas atrophy into assertions without strong resistance.

Hence cults and such groups either close their membership to keep their message pure, or else congregate regularly to strengthen and confirm their views. Such groups are not necessarily geared to truth seeking, any more than individuals. Remember that this is not to say that people are incapable of truth-seeking, but that this is not the primary function of reasoning.

Skeptics may feel comfortable with this unflattering depiction of the operation of cults, but remember that we have our monthly meetings too. We are subject to the same sets of impulses in terms of confirming our beliefs. But does this imply parity of purpose? Or effectiveness? Well, as it turns out, this depends entirely on some very clear characteristics of the group.

Group reasoning has three broad outcomes: the group may converge on a belief held by all individuals regardless of its intended outcome; the group will become polarised; or members of the group will change their individual beliefs to a collaboratively developed one. So what determines which it is?

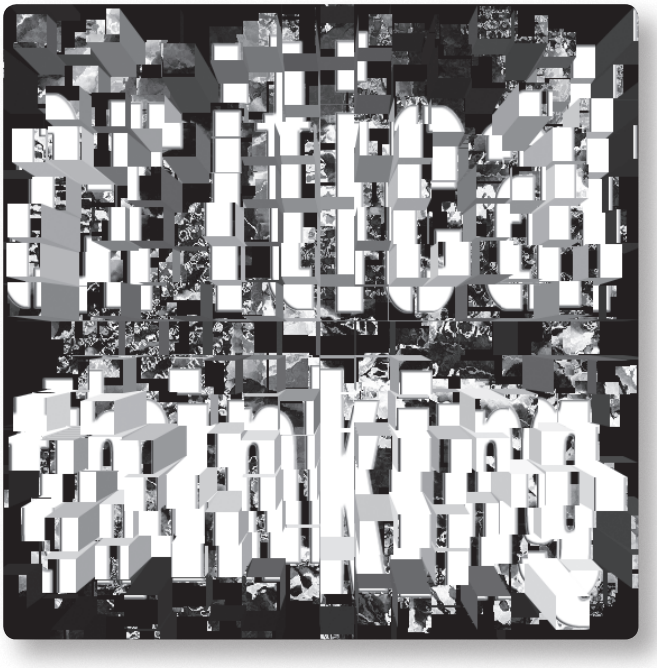
Unsurprisingly, groups whose prime function is to aggregate people who share the same point of view, without a willingness to change, coalesce into a homogeneous and even more definite congregation. Those grouping without an initial common desire, or who contain homogeneous subgroups, polarise into camps, and those whose clear goals are to truth-seek and to change as required to meet that end, end up with a level of reasoning verifiably better than that of any individual. This latter group demonstrates how best to utilise the evolutionary function of reason as it was selected for and is the group that best exemplifies reasoning skills and best educates its members to reason individually.

To instantiate some of these, consider in the first case some religious or some political groups whose premises are unshakable and not subject to review. What is missing from these is the willingness to follow where the community of open inquiry will lead. Rather than a path of discovery, we find well-trodden paths of dogma. Argumentation consists of setting up strawmen for public demolishing as entertainment for all.

One of the most obvious cases in this category is Young Earth Creationism. Mantras such as "There are no transition fossils" are never tested, but seized upon to confirm and strengthen existing beliefs. In the same way, there are not many people in the climate debate who started on one side and moved to the other, they are pretty much ideological homeboys.

In the second case, this is a fair reflection of much of what goes on in public debate, with the response to climate science a classic case. If you think the argument is about science, you're off the mark. Were it just about that, your religious or political persuasion would not be an issue. Neither would your wealth, age or occupation. That fact that all of these are hugely influential in determining the likelihood of your stance on the issue speaks volumes: they all set up inferences that strongly seek confirmation in whatever interpretation of the evidence works to do so.

> "It is demonstrably true that humans are rather bad at using individual reason as truth seeking."



In the third case, there are two methodologies that stand out for me: science and education as collaborative philosophical inquiry (sometimes called "community of inquiry" or simply "philosophy for children").[7]

These last two have some interesting things in common. In both cases the group will commit to truth-seeking as its highest purpose (remember I'm taking collectively here), the members will respect and engage meaningfully with other members, the paradigms

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and methodologies by which the group operates (for there must be some) are subject to continual review and are created and endorsed by the group, and there is a commitment that evaluation and justification is grounded in common reason and experience accessible to, and verifiable by, all members.[8]

Interestingly, this type of collaboration can be successful without having to overcome a slew of cognitive biases, it is not necessary to make all members perfect reasoners to make the group work. To be sure, some training in formal logic is nice, but in many cases this comes out of the group dynamic as part of the methodology by which the group operates. A confirmation bias can even be a highly efficient mechanism for dividing the cognitive load among a group, as each person need only propose their point of view and look for flaws in others as is their natural tendency. If the intention of truth-seeking is maintained, and the willingness to change acknowledged, then the outcome can still be satisfactory.

Let me reiterate that this type of effective group reasoning is not about summing the parts. Traditionally we think that if one person knows A, another knows B and a third knows C, then together they will all know A, B and C. This may be true, but effective group reasoning is also about more than this. It is about overcoming the inherent unwillingness each of us has to look for reasons beyond those that support our own views, and using the willingness and creativity of others to support their own positions to test and try ours.[9]

Groups may operate more reasonably than individuals, and errors in reasoning can be systematically identified and corrected by collective wisdom. Far from members sheepishly submitting to the 'orthodox' view, they actively contribute to create an entity of greater rationality than any individual can claim - and receive more than they give to boot (in science writ large, we know this can take time but the pressure is relentless). It is significant that while this is based on a theory of social reasoning, it offers testable and accessible mechanisms to show how individual reasoning can be improved.

INCLUSIVE REASONING

So then to the question: what does this mean for groups and individuals who promote evidence-based reasoning? Well, there is certainly no reason not to keep doing what we've been doing - of course public education, pointed messages and direct confrontation of dangerous ideologies and practices are important, and the Australian Skeptics is a fine example of making a difference by doing these things.

But there is room for making even greater inroads, by figuring out ways to work more collaboratively. Not with the hard-core anti-vacs and their ilk (there are times, as I say, when the hammer needs to fall) but with the public in shifting the focus from informing to collaborating.

The delineation of good and poor practice is important, but it does not have to mean the exclusion of the individual with the practice. In fact, the more such exclusion occurs, the greater the polarisation of the population – for all the reasons outlined above. While I know many people are inclusive and do not equate the rejection of the idea with rejection of the individual, many do. As an educator, I find one of the most paradigm-shifting moments for students is the realisation that if all views are equal all views are worthless, and the necessary next step that one can respect the person while rejecting the idea. I do not think this is overtly stated often enough, nor does it appear as a theme in conferences or debate.

We must also be careful with language, as it can be inherently exclusive or inclusive. Some time ago, a woman who maintained that it was true for her that ghosts exist confronted me. Now, this is not just a claim about opinions, but about the actual existence of ghosts. We could have had a great clash of ideas here, but as it turned out I asked her if she really meant it was true that she believed that ghosts exist. She was initially resistant to this, but when I asked her if it could be true for someone that gravity was repulsive, she relented. As it turned out, there was no conflict.

I am not naive about this. I realise that we often need to act through the media, and that this demands a succinct position and pointed commentary. I also know that sometimes we need to act reactively and in direct opposition, and let's keep doing that. But I am also saying that if we want to maximise our effectiveness we need to be more inclusive as a broad principle of engagement. Interactions that are exclusively, or even strongly, confrontational lead to polarisation. Quite simply, and to appeal to common ground, this is what some very good evidence is saying.

Another driver for change is this: I know of no one who is satisfied with the standard of public debate in Australia. The extreme polarisation of our political views and the process by which it occurs is both breathtaking and disheartening. The role of the media in this, be it a plastic, amoeboid response to public opinion or as a producer of headlines, or both, is absolutely central.[10] When this permeates our lives, it significantly shapes our views and methodologies; in fact this becomes a sort of community of inquiry itself by which people learn to interact by assertion.

Let me be explicit, if the media do not devote time and patience to reasoned argument, be it because of the politicians on which they are reporting or as a function of their own style, or if people do not see such argument otherwise in other environments, then it is harder for individuals to do so. The same can be said for education programs and pedagogies. It is not controversial that we develop internal habits that mirror what we experience externally. Obviously, we are not all simply puppets on a sociological string, but the large extent to which it happens is dangerously deceptive.

We need therefore to encourage active engagement and a much higher standard of public debate. This means something very specific. It means that public utterances should be clear, justified, open to review and delivered with an honest intent and a belief that the position declared is the best possible one. This is not to say that there is no such thing as a political position, but rather that the principles that underpin the position are as well articulated as possible using commonly accessible rules of evaluation and justification that go beyond simple assertion. We must demand this of our leaders and policy makers and be prepared to point out when this is not done well, and how it could be improved. Not just over significant issues, but as a matter of habit.

How these things are achieved is something we all need to work on (in the spirit of collaborate inquiry), but we can imagine many more outcomes that would be a consequence of such work (or at least a lack of outcomes that would show a need for it). It is recognition of the need to be proactive and not just reactive.

The purpose of this article is to raise some questions about our methodology, and to review our practices in the light of recent thinking. Recall that reasons mean different things to different people, and getting the best critical thinking happening takes more than just laying out the skills. The best performing critical thinking courses also articulate in detail the reasoning process.

In this we fight cognitive biases of all sorts that are not broken, ill-formed handicaps to thinking but inevitable consequences of how and why we reason. They can be most effectively overcome/harnessed by treating them as the latter, and this requires the type of reasoning that we evolved to do, an inclusive, social and engaging process of collaborate inquiry. We still need the shock troops, but we can do things strategically to give better help to those on the front lines. ■

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NOTES

1. Show me a shock jock who doesn't hold their ability to reason above that of others.
2. Again, this does not mean all reasoning is equal, just that the process can be pliable enough to allow a construction to stand.
3. Critical thinking when done properly can also become an unconscious process, or "habit of mind".
4. After all, when framing an argument in isolation we still do so with an intended audience or pretend opponent in mind.

> "I know of no-one who is satisified with the standard of public debate in Australia."

5. The Wason selection test is the classic example, but the references contain many others.
6. They call it the "Argumentative Theory of Reasoning".
7. This is a well established and growing movement, most common in primary schools, in which intellectual processes (not content) are developed collaboratively and with full engagement of students. The evidence is strong that this produces highly effective learners and thinkers.
8. While we can't individually verify all the science reported in journals, for example, the method by which it was obtained and the nature of the peer review process is open and verifiable.
9. Even experts with many facts at their fingertips are in danger of individual error, simply by virtue of the fact that they can so readily call up a raft of reasons why they are right and satisfy their own need to validate their initial judgements. I am not saying experts are more prone to error than others (though in some areas, particularly those outside their strengths, they have been shown to be so), but simply that their expertise can be a double edged sword.
10. I am currently working on a Masters level course in critical thinking for journalism students – in terms of resources, the world is my oyster.

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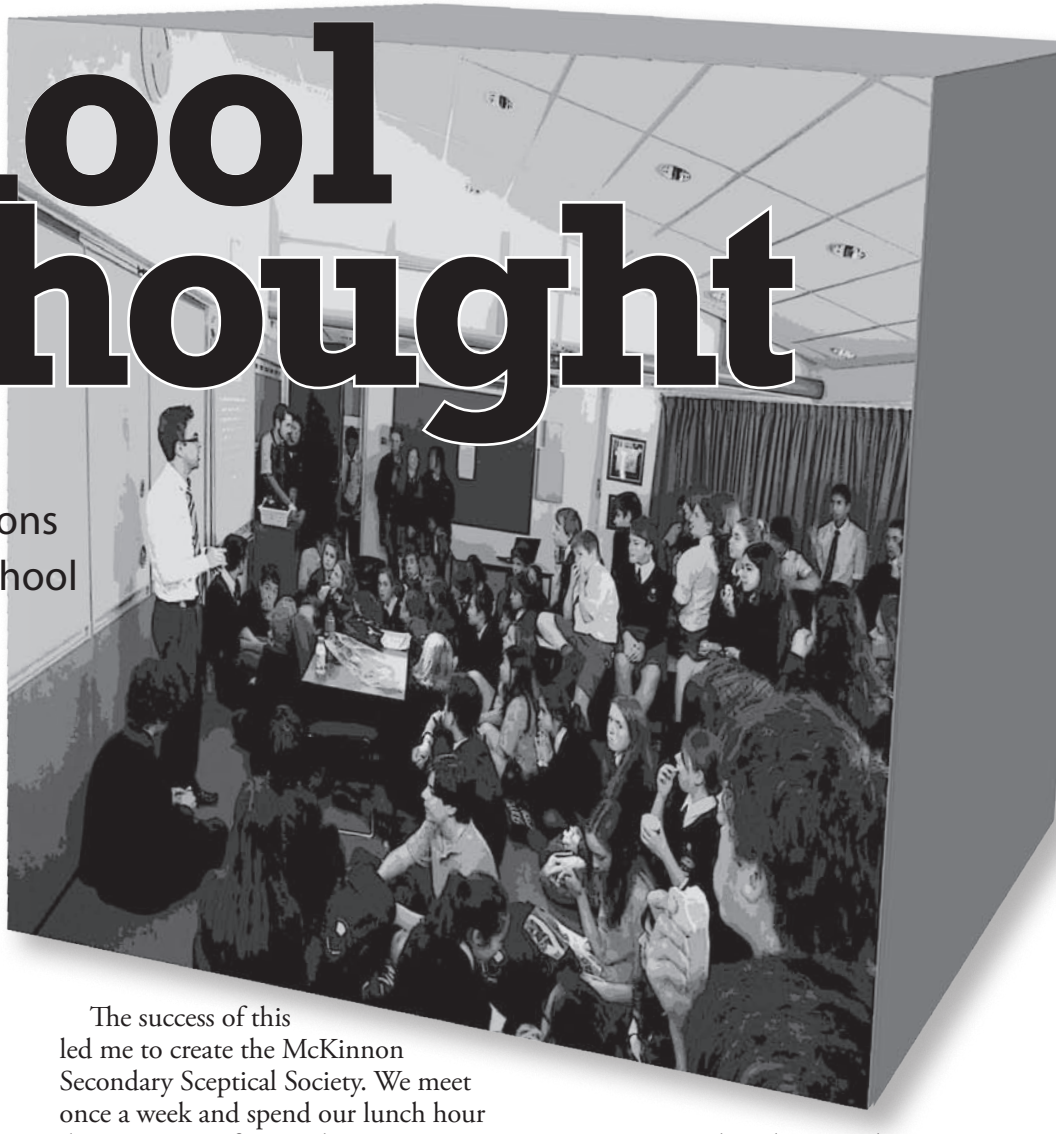
School of Thought



Adam van Langenberg gives practical suggestions on how to run a high school sceptical 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 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/con artists 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're all 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 mind 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

Before I get bombarded with angry comments, be aware that to most teenagers the word "science" means sitting in a classroom while a teacher talks about a bunch of boring stuff that you don't care about. Sure, you might get to do the odd experiment now and then 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.

> "The next thing you know, kids have learnt a bit of science and why it's important. They'll also learn why it's 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. Even in a fairly secular country like Australia, I wouldn't risk it. 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 because of their religious beliefs. In fact, I steer clear of any religious topic (unless somebody brings it up) for that reason alone. If somebody brings up a testable religious claim (such as creationism) I'm always happy to discuss it, but I will never make them the focus of a session.

A lot of my children come from very religious families - 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.

If you really want to start a secular or atheist group, make it separate to your sceptical group. Many people believe that Christians, Jews and Muslims can't be sceptical, but do you really want to stop them from learning critical thinking skills simply due to their religious beliefs?

Left: Student gathering at McKinnon College - bring your own lunch and scepticism

Right: Testing the results. A good example of science in action (but no copying please).

School of Thought *Continued...*

Above: The scientific method, using Zener cards to test 'psychic powers' and keeping tabs on the results. Below: Visiting skeptic Richard Saunders shows what to do with school cutlery.

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. Normally I would have told them to wait till 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 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 a child 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. ■

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Stretching THE TRUTH

Belinda Nicholson throws yoga to the mat, and finds some good and some bad.

I love yoga. There are few things I enjoy more than stretching my body and meditating in the quiet space of my yoga mat. At the end of a busy, stressful day, I relish in the time of self reflection and relaxation I find in a yoga class, as well as the chance to properly stretch my tight muscles from a long day sitting down behind a desk staring at a computer screen.

For those of you unfamiliar with yoga, it is a physical and mental practice that combines postures (asanas), body locks (bhandas), hand gestures (mudras) and breathing technique (pranayama). Hatha yoga is the name given to the physical movement aspect of yoga and this comes in a variety of styles such as Vinyasa, a flowing style of yoga, Iyengar, a style focussed on alignment of the body, and Kundalini, a style of yoga that focuses more on breathing and chanting along with small gestures and movements.

There is a large body of evidence supporting the physical and mental benefits of yoga practice, from managing chronic lower back pain1 to decreasing anxiety levels2. Unfortunately there is also a cloud of pseudoscience that looms over yoga and yogic beliefs. Not only is yoga associated with irrational belief and nonsense, but some styles even incorporate these ideas into the practice of yoga.

An example of this is the belief in chakras. There is a belief in some yogic teachings that the human body has an energy field, or aura, and that there are seven energy centers, or 'chakras', located in the crown, forehead, throat, heart, solar plexus, navel and the base of the spine. These chakras vibrate at different frequencies, and the practice of yoga is meant to balance these frequencies and to connect a person with the universal energy, or 'prana'.

This is certainly an interesting way of thinking about the body, and about the way we interact with the world through 'energy', but the ideas are meaningless in the face of reality. In some ways we do interact through energy and vibrations: with sound and light, kinetic and electromagnetic energy. But this is not the sort of energy they are talking about. Instead, there is a sense that this is a 'magical' type of energy, one that fills our bodies and flows through the chakras from one person to the next.

I have not seen any evidence to support the existence of such a type of energy, nor do I think it exists. If it did, the laws of physics would need to be rewritten. In my opinion, what is happening here is the use of energy as a buzz word to describe something intangible - a shared experience between people, a kind of 'warm, fuzzy feeling' that the practice of yoga can bring. There is nothing wrong with this feeling, it is a perfectly human thing to feel, and it is important to embrace our humanity in this way. However, the confusion that arises due to the use of terms like 'energy', which already has a specific scientific meaning, should be avoided.

Even though the use of these buzz words and pseudoscientific concepts grates on me, it does not stop me from attending and enjoying my weekly classes. Such associations should not prevent anyone from enjoying the very real mental and physical health benefits of yoga. You do not have to take on board everything that your yoga instructor says, only the things that you find helpful and that you and your doctor agree is safe for you to do. Yoga might not balance your chakras, but there are still benefits to be had by all. ■

young australian skeptics

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Miracles of Medicine?

With no valid evidence, a medical scientist claims supernatural origins for a scientific field in which he is considered a pioneer. Traian Chirila tries to understand how and why this could happen.

Right: Post Fra Angelico, a painting of Damian and Cosmas fitting a new leg - wrong colour, but it'll do.

The history of science and medicine, and the origins of specific fields, can be a fascinating topic, revealing how a particular practice has developed over the decades and centuries.

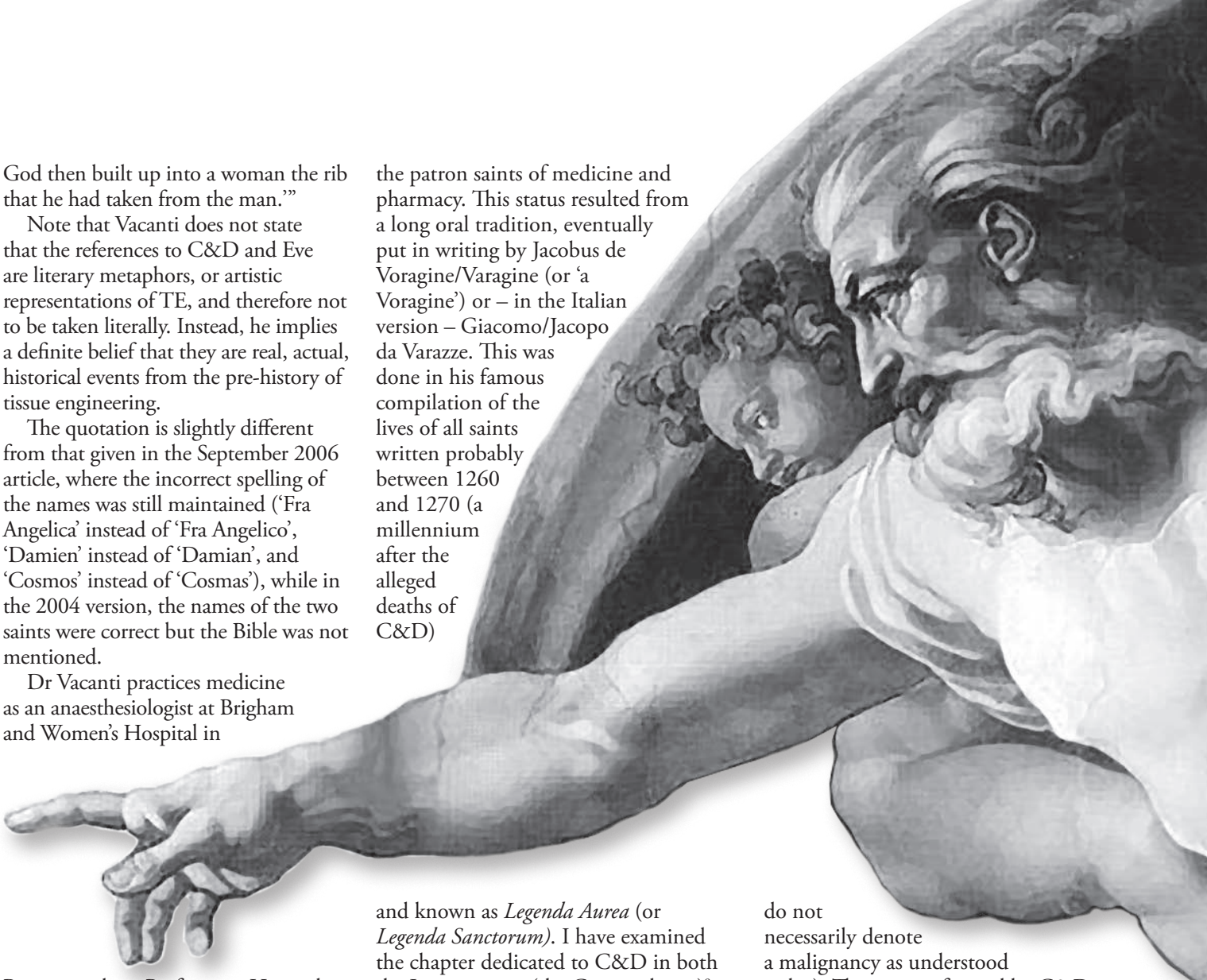
In the field of tissue engineering, one scientist, a pioneer in the discipline, has done such an historical review ... with a difference.

Tissue engineering (TE) is a multidisciplinary field of biomedical research aiming at the development of functional substitutes able to compensate for tissue loss or to restore failed organs in patients. This is achieved by the ex-vivo manipulation of cells and tissues and their combination with scaffolds or matrices made of natural or synthetic materials, followed by implantation of the constructs into the appropriate sites in the patient's body. Based on a multitude of converging definitions[1-3], TE is featured nowadays as a discipline on its own, although the borderline between this field and the newer field of regenerative medicine is blurred, as their methodologies are generally similar.

The development of TE commenced in Boston, USA, and the true pioneers of TE were Eugene Bell[4] and Ioannis Yannas[5], working independently at both Harvard Medical School and MIT. Later, Joseph Vacanti, Charles Vacanti and Robert Langer from the same two institutions also became involved, and their contributions helped further the establishment of TE as an independent research discipline.

In 2006, Charles Vacanti published a review of the history of this fast-growing field. Actually, two slightly different versions were published in the same year in two different peer-reviewed scientific journals: one in May in *Tissue Engineering* (the official journal of Tissue Engineering and Regenerative Medicine International Society, where Dr Vacanti appears as the 'Founding Editor'), titled "History of tissue engineering and a glimpse into its future"[6], and the other in September in *Journal of Cellular and Molecular Medicine*, titled "The history of tissue engineering"[7]. Both articles evolved from an earlier and shorter article published in the magazine *The Scientist* in November 2004 under the title "Cells for building"[8]. In all three versions, we can see a statement regarding the origins of TE. The following is what appeared in the first mentioned article (May 2006):

"Although the famous painting by Fra Angelica [sic] entitled Healing of Justinian, which depicts the brothers Saints Damien [sic] and Cosmos [sic] transplanting a homograft limb onto a wounded soldier, is often referred as the first historical reference to 'tissue engineering', the oldest written description can be found in Genesis 2:21-22: 'The Lord, breathed a deep sleep on the man and while he was asleep he took out one of his ribs and closed up its place with flesh. The Lord



God then built up into a woman the rib that he had taken from the man.'"

Note that Vacanti does not state that the references to C&D and Eve are literary metaphors, or artistic representations of TE, and therefore not to be taken literally. Instead, he implies a definite belief that they are real, actual, historical events from the pre-history of tissue engineering.

The quotation is slightly different from that given in the September 2006 article, where the incorrect spelling of the names was still maintained ('Fra Angelica' instead of 'Fra Angelico', 'Damien' instead of 'Damian', and 'Cosmos' instead of 'Cosmas'), while in the 2004 version, the names of the two saints were correct but the Bible was not mentioned.

Dr Vacanti practices medicine as an anaesthesiologist at Brigham and Women's Hospital in Boston, and is a Professor at Harvard Medical School. As mentioned, he made and continues to make valuable contributions to TE. Here, however, I am discussing a situation that I found rather unfortunate.

We are used to assertions about the literality and inerrancy of the Bible coming mainly from people with no or little scientific education. It is of great concern when such an idea is propagated by reputable scientists in reputable journals. It is even more disturbing when scientists display belief in 'saints', a gratuitous contrivance of the Catholic Church. While the 'sainthood' institution was perhaps the most innocuous imposition of the church, its criteria are ridiculous and based on supernatural or fictional elements.

THE SAINTS' MIRACLE

Saints Cosmas and Damian (henceforth C&D) are regarded as the patron saints of medicine and pharmacy. This status resulted from a long oral tradition, eventually put in writing by Jacobus de Voragine/Varagine (or 'a Voragine') or – in the Italian version – Giacomo/Jacopo da Varazze. This was done in his famous compilation of the lives of all saints written probably between 1260 and 1270 (a millennium after the alleged deaths of C&D) and known as *Legenda Aurea* (or *Legenda Sanctorum)*. I have examined the chapter dedicated to C&D in both the Latin version (the Grässe edition)[9] and in a reprint[10] published in 1900 of the English translation by William Caxton (originally published in 1483).

Giacomo was the archbishop of Genoa from around 1290 until his death about a decade later. His *Legenda Aurea* was the best-seller of the Late Medieval Ages and the Renaissance, surpassing by far even the Bible, and reprints and new editions continued steadily to be published ever since. In the chapter about C&D, Giacomo stated that the two doctor-brothers were martyred in year 287, during the Emperor Diocletian's persecution of the Christians.

At the end of the chapter, he recounts the transplantation of a cancerous (or gangrenous) posterior limb (the terms 'cancer'[9] or 'canker'[10] do not necessarily denote a malignancy as understood today). This was performed by C&D, the 'recipient' being an attendant in a church dedicated to C&D by Pope Felix IV, while the 'donor' was a deceased African (described as Ethiopian or Moor) interred a short time prior to the operation. The surgery took place while the patient was sleeping but he could hear the saints' comments in his dream. It is not clear what part of the limb was transplanted; the Latin text includes both 'crus' (leg, shin, foot) and 'coxa' (hip), while Caxton made a compromise and translated both with 'thigh'. This aspect is important: if the allegedly replaced part was a thigh, we have to accept that an intercalated transplantation was carried out. Needless to say, the complexity

> "It is of great concern when a [Biblical] story is propogated by reputable scientists."

Miracles of Medicine *Continued...*

Below: Not a happy ending for two saints, but perhaps a case for a transplant or two.

and difficulty of such an operation are extreme; to my knowledge, it has never been attempted in humans.

It appears that Dr Vacanti got the story of the so-called 'miracle of the black leg' from a painting by Fra Angelico, not from *Legenda Aurea*. Indeed, this 'miracle' has inspired many artists[11-13]. Religion has motivated great paintings, sculptures, monuments and music, but their artistic value has nothing to do with the supernatural source of inspiration or with the veracity of their topics. Regardless of its aesthetic beauty or artistic value, a religious painting cannot be invoked as scientific evidence.

Apart from the fact that organ transplantation does not belong to TE according to its current definition, there are some problems regarding this 'miracle'.

The papacy of Felix IV was a relatively short one (526 to 530), and his main achievement toward the end of his reign was the conversion of an ancient monumental structure known as Templum Pacis into a church that he dedicated to C&D[11]. If, as the *Legenda Aurea* says, the patient who underwent the transplantation was working at the time in that church, then the transplantation must have been carried out at least 250 years after the saints' demise!

If, for the sake of argument, we accept that 1500 years ago someone performed this operation as described, it is beyond comprehension how that was possible without any knowledge and skills in microsurgery, anaesthesiology, pharmacology and immunology; with no proper surgical facilities and tools available; operating in totally non-sterile conditions; using a donor organ that was harvested from a cadaver already buried underground and, very likely, in a certain stage of decomposition; and without administering the mandatory antibiotics or immunosuppressants. I should mention that overriding the immune response is a serious challenge even in our times, and leg transplants using allografts are seldom attempted.

Then there is the issue of whether C&D actually existed. When you are confronted with three sets of C&D which are celebrated throughout the Christendom, each at a different festive date and each with a different story of their demise (for instance, one set was not martyred at all), with at least *four* sets of relict skulls attributed to C&D and located in Spain, Germany and Austria, and with many other body part relics spread through Europe (even in England, where the cult was minor[14]), you start to wonder whether these saints are nothing but a figment of the imagination. To be sure, this aspect does not prove that C&D never lived, but throws considerable doubt on the possibility of their existence.

Sensing perhaps that a safer ground is needed for claiming some sort of antiquity for the TE field, Dr Vacanti further asserted that, in fact, "the oldest written description"[6] ("written reference"[7]) is to be found in the Bible, more precisely in the episode describing how God created the first female of our species by using a rib harvested from the first male (already in existence and presumably needing a companion). Consequently, the Bible (Genesis) was cited as reference "1"[6] and, respectively, reference "2"[7]. I will abstain here from attacking the veracity of the Bible, as many have done it before convincingly and masterfully. Of course, the Bible and religious literature can be legitimately cited as references in scholarly journals dedicated to humanities such as biblical studies, theology, and history of religion. However, this is a completely different situation.

Without going too deeply into the theory and application of the scientific method, where testability plays a defining role, we still can analyse objectively the hypothesis formulated by Dr Vacanti. This hypothesis predicts that two mythical events, ie the creation of Eve from a rib removed by God from Adam's thorax and a successful limb transplantation performed about 1500 years ago by Saints Cosmas and Damian, constitute the episodes marking the beginning of the scientific

research field that today we call tissue engineering. The hypothesis is not testable because there is no proof to date either that the characters involved (God, Adam, Eve, Cosmas, Damian) have actually existed or that the events claimed have actually occurred, and neither is any method of testing their occurrence.

According to our hypothesis, tissue engineering has its origin in the activity and achievements of certain biomedical scientists in Boston, USA, starting in the 1970s and continuing through the 1980s. This hypothesis is testable through the published records of the experiments and the results reported by those scientists in peer-reviewed scientific journals and books.

As Vacanti's hypothesis makes predictions concerning circumstances beyond our capability to test, it should be modified or abandoned.

I would have expected that a man with Dr Vacanti's background should experience at least some doubt about the reality of the alleged construction of the first human female as it is described in the Bible, or about a successful leg transplantation supposedly performed 1500 years ago by two characters from legend. Besides, with no disrespect intended, I am surprised that anyone would make efforts to demonstrate a sort of ancient pedigree for TE, when obviously there is none, and neither is there any need for one.

NOT ALONE

I shall not single out Dr Vacanti as the only target of my critique, as other scientists have also included the C&D's miracle in articles published in scientific journals[11-19]. A chapter in a recent book[20], otherwise an exceptional review on the history of TE and regenerative medicine, presents a number of myths as historical beginnings of these fields, including the Prometheus myth, the Biblical creation (and yes, the Bible is cited again as a reference!) and the 'miracle of the black leg'. It is difficult to know whether all these authors actually believe in God and/or in religious anecdotes. Perhaps some of them were impressed by C&D's status as patron saints, and did not pay much attention to the historical and scientific truth. One may also suspect that some authors merely wanted to display their extracurricular erudition, while in fact they were displaying nothing but a deficient critical thinking.

> "Regardless of its beauty or artistic merit, a painting cannot be invoked as scientific evidence."

In this sea of religious nonsense, an island of reason was raised by a hypothesis put forward by Dr Hutan Ashrafian, a clinical lecturer in general surgery at Imperial College, London [21]. According to him, the inspiration for the 'black leg miracle' was a case of limb ischemia secondary to ergotism. This condition, which has been common for many millenia, is the effect of ingesting ergot alkaloids when cereals infected with the fungus *Claviceps purpurea* are eaten, and presents two types of symptoms, convulsive (hallucinations, delirium, seizures, psychosis etc.) and gangrenous, when some extremities or limbs become necrotic and change their colour. A person affected by ergotic psychosis may believe that his blackened leg is different from the original one and was transferred from a dark-coloured person; in this case, by some benevolent saints. Anyway, at the stage when both symptoms occur, the patient is left with little chance of survival.

Left: Adam sleeps and Eve makes an appearance. Was God just ribbing them?

There are religious believers among scientists in the USA. We should not forget that Dr Vacanti lives in a country where about half of the general population believe that everything that is in the Bible is literally true, that Jesus will return soon, or that there is life after death, and at least three quarters believe in the existence of angels.

According to a classic study[22] published in 1998 in *Nature*, seven per cent of a sample of members of the National Academy of Sciences of the USA (NAS) believed in a personal God and about the same number believed in immortality of the soul. While the authors regarded the result as good news for the scientists' camp, I think that zero per cent would have been much better news. In fact, I suspect that these figures might be even larger nowadays, considering the formidable propaganda machine of the USA's Christian Right supported by well-subsidised pressure groups and powerful political entities. Even more worrying is that in 1998 the same elite body of American scientists unequivocally defined its position regarding the teaching of evolution in a way that opens avenues to the supernatural element. In a document titled "Teaching About Evolution and the Nature of Science", authored by the NAS Working Group on Teaching

Miracles of Medicine *Continued...*

Evolution, it was clearly stated[23] that "Science can say nothing about the supernatural. Whether God exists or not is a question about which science is neutral." Pretending that there is no conflict between science and religion is not only disappointing but also terrifying. I can imagine that many scientists in the USA might not have the courage to display their humanistic, freethinking, agnostic or atheist convictions from fear that it will put at risk financial support for their research.

Anyone is free to make a choice whether to be or not to be a religious person. The notion of a religious scientist is not incongruous as long as that scientist maintains professional accuracy and honesty when reporting scientific results, *regardless* of his/her beliefs. I always surmise that scientists are aware that there is no scientific evidence to support Biblical fables or the stories about miracles wrought by saints, and I expect – perhaps naively – that any scientist would therefore conclude beyond a reasonable doubt that such events never happened. Both Biblical and post-Biblical myths were created by individuals with no concept of coherence or historical accuracy and, anyway, with no desire or interest to be accurate. Personally, I abide by the uncompromising view that religious lore is both fictional and irrational, and therefore does not have any place in a scientific report.

I strongly disagree with anyone including supernatural elements in scientific reports or using anecdotes in support of scientific claims. Whether religious or not, the anecdotes have no place in science; their use is the 'marker of pseudoscience'[24]. And pseudoscience belongs to tabloids and other inferior media outlets. The only way real science can advance is hard evidence, which belongs to the peer-reviewed scientific journals.

I conclude that a supernatural origin for the tissue engineering field is not supported by the evidence provided by Dr Vacanti. As a scientist, I must also express my serious concerns when peer-reviewed, highly-ranked scientific journals allow the publication of scientific arguments based on presumed activity of mythological characters, or the use of the Bible as a citable reference. Such sources are definitely outside the mainstream of real science and should not be accommodated in scientific periodicals. As scientists, we have to educate ourselves out of superstition and religious arrogance into reason and humility, before educating others about science. ■

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Run for your Life!

Looking forward to the end of the world? Brian Dunning has some bad news.

Abandon all your possessions and head for the hills: It has been foretold that the world is coming to an end sooner than you think, in the year 2012. It seems that you can't pick up any newspaper or magazine without reading that the apocalypse is almost upon us.

What really is going to happen this year? Asteroid 433 Eros passed within 17 million miles of the Earth in January; the United States will hand over control of the Korean military back to the Koreans in April; there will be an annular solar eclipse in May and a solar transit of Venus in June; the Summer Olympics will take place in London; according to the US Census Bureau the Earth's population will officially pass seven billion people in October; the United States will elect a new President in November; construction of the new Freedom Tower will be complete in New York City; the sun will flip its magnetic poles as it does at the end of every 11-year sunspot cycle; and, as I'm sure you know, the Mayan calendar completes its 5125 year cycle, presumably portending the End of Days.

Mayans had three calendars. They had a solar calendar that was 365 days long, and a ceremonial calendar that was 260 days long. These two calendars would synchronise every 52 years. To measure longer time periods, they developed the 'long count' calendar, which expressed dates as a series of five numbers, each less than twenty; something like the way we measure minutes and seconds as a series of two numbers each less than sixty. And, just in case this might seem too simple, for some reason the second to last number was always less than eighteen. The first day in the Mayan long count calendar was expressed as 0.0.0.0.0, and by our calendar, this was August 11, 3114 BC. Every 144,000 days (or about every 395 years, which they called a *baktun*), the first number would increment, and a new *baktun* would start.

Recall how we all got to enjoy the excitement on the millennium of watching the digital displays roll over from 12/31/1999 to 1/1/2000? Well, that's what's going to happen on December 21, 2012 to the Mayan calendar. It's going to roll over from 12.19.19.17.19 to 13.0.0.0.0, just as it has done each of the previous twelve *baktuns*. There's no archaeological or historical evidence that the Mayans themselves expected anything other than a New Year's Eve party to happen on this date: Claims that this rollover represents a Mayan prediction of the end of the world appear to be a modern pop-culture invention. It's true that the Mayan carvings of their calendar only depicted 13 *baktuns*, but what did you expect them to do? Carve an infinitely long calendar every time they wanted to express a date? The explanation could be as simple as they didn't expect people in the 21st century to still be obsessed with their archaic calendar.

Another story predicting doom in 2012 says that a new planet, variously described as Planet X, a planet/comet (which makes no sense), or the planet 'Nibiru' is going to pass so close to the Earth as to cause earthquakes and tidal waves and all kinds of destruction, possibly even flipping the Earth completely upside down. This is an urban legend that's been around for a long time, but for most of the story's history, this was supposed to happen in May of 2003, as any Internet search for "Planet X" will reveal. Apparently what happened is that the Planet X advocates, perhaps embarrassed or disappointed that 2003 passed without incident, heard about the much more popular Mayan calendar story, and decided that 2012 is close enough to 2003 that it must be the correct date and that the Planet X destruction is probably what the Mayans were foretelling.

The Planet X legend got started

Illustration from Goodwallpaper.com

by misinterpretations of astronomical observations combined with an ancient Sumerian carving that has been erroneously interpreted to depict a solar system with ten planets. Why the craftsmen who made carvings in ancient Sumeria should be presumed to have planetary knowledge superior to that of modern astronomy is not convincingly argued. If you're interested in all of the actual science behind the Planet X story, there's no better source than Phil Plait's *Bad Astronomy* blog, which goes into all the facts, rumours and sources in detail.

Here's one more reason people are frightened about 2012. About 500 years ago, Copernicus confirmed what Hipparchus had observed in the second century BC that the axis of the Earth, which leans over at 23.5°, completes one full rotation every 25,765 years. This means that in 12,000 years, Christmas will come to Australia in winter and the northern hemisphere will depict Santa in Bermuda shorts. Astrologers call this period a Great Year, and they divide it into 12 Great Months or astrological 'ages', each about 2147 years long. Each age corresponds to one of the signs of the zodiac. We are currently in the Age of Pisces, and like the song says, we're soon going to enter the Age of Aquarius. According to modern official delineations of the edges of the constellations, we'll move into the new age in the year 2600. But there's some disagreement, and some astrologers place it at 2595, 2654, or 2638. A few put it much earlier, as soon as 2150 or even 2062.

However, once the news of the Mayan calendar broke, a large segment of the astrological community abandoned the official constellation definitions and stated that the Age of Aquarius will begin in 2012. So, you can call this a third major reason why the world will end in 2012, but you have to be awfully loose with your astrology, and you also have to think of some reason why the dawning of the Age of Aquarius might bring on the end of the world. I have not found any plausible claims for how it might have this effect.

So that's a lot of reasons, weak though they might be, to predict that we're all going to die in 2012. However, there's one significant fact that the 2012 doomsayers all seem to forget: Despite all the various 2012-ish predictions for the end of the world, there are far more stories of apocalypse with different dates. For example, popular interpretations of Nostradamus found predictions for the end of the world in July of 1999, December of 1999, June of 2002 and October of 2005. It's also been said that his writings could mean the dead will rise from their graves in either 2000, 2007 or the year 7000. Nostradamus never said anything about 2012.

Many Protestant Christians believe that the end of the world will come in the form of what they call the Rapture, when the righteous will all be whisked away to heaven. Shakers believed the Rapture would come in 1792. Seventh Day Adventists first calculated it would happen in 1843, then when nothing happened, they found an error in their calculations and corrected it to 1844. The Jehovah's Witnesses made firm predictions for 1918, 1925, 1941, 1975, 1984 and 1994. A book was published in 1988 called *88 Reasons the Rapture* is in 1988. A number of Bible scholars found firm scriptural evidence that the Rapture would happen in October of 2005. Thousands of Koreans gave away all their money and possessions in preparation for

Run for your Life!

Continued...

the Rapture on October 28, 1992. Even Sir Isaac Newton made a calculation based on scripture that showed the Rapture could not happen before 2060. Some Jewish scholars place the 'end of days' via Armageddon in the year 2240. I couldn't find 2012 mentioned in any of these stories.

In fact, James Randi's magnum opus publication *An Encyclopedia of Claims, Frauds, and Hoaxes of the Occult and Supernatural*, lists 44 distinct end of the world predictions that all came and went unfulfilled. Why should we think that the 2012 legends are any different? Any examination of the science behind any of the stories; even a glib examination, reveals a complete absence of plausible foundation. Only the Planet X story, which is the most easily falsified as it depends on concrete astronomical observations that are demonstrably false, offers a proposed mechanism for exactly how this end of the world is to be accomplished - the alleged gravitational destruction. Neither the Mayan calendar people nor the Age of Aquarius people have offered any claims for how or why the world will end, only that their particular legend points to a rollover in some ancient calendar. My calendar rolls over every time the ball drops in New York's Time Square, and I've yet to see this cause any planetary cataclysm, except for the guy who has to mop out the drunk tank at the NYPD.

Many people tend to place more trust in ancient Neolithic traditions than in the observations of modern science. There's nothing wrong with studying and respecting our predecessors' history for what it was, but when you turn things over and start believing that scientific knowledge of the natural world has only decreased over time, you're not doing anyone any favours. ■

IMPORTANT NOTICE

It is Australian Skeptics' policy that, if the world does end in 2012, we will reimburse our readers with the balance of their subscription fees.

Note: This article is a transcript of an episode of Skeptoid (episode #93, March 25, 2008). It is used with permission and is copyrighted to the author.

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Your Stars: MARCH 2012

With our Astrologer Kryptik Klews

Aries: 19 April -13 May
Ear is bad for a ram.

Taurus: 14 May - 19 June
We suffered damage? That's bull.

Gemini: 20 June - 20 July
Precious stone in one that is two.

Cancer: 21 July - 9 August
Able gent heard to cause disease?

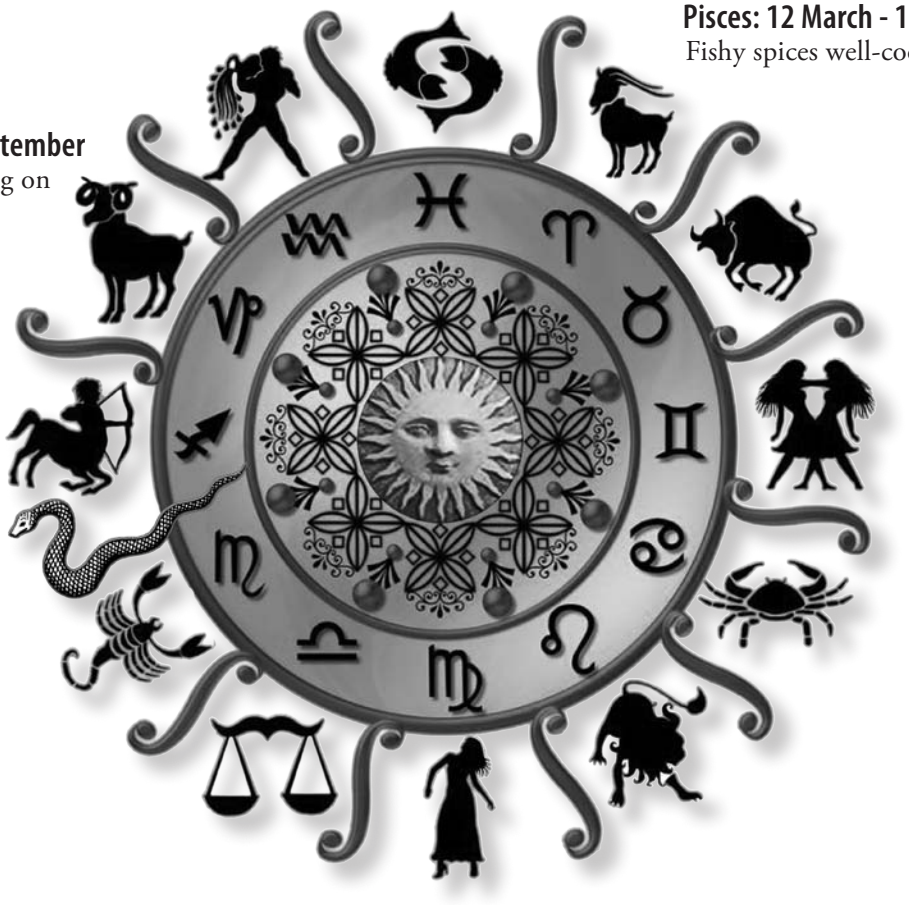
Leo: 10 August - 15 September
The French have nothing on a lion.

Virgo: 16 September - 30 October
Six are told to leave the maiden alone.

Libra: 31 October - 22 November
Use scales if the touchy reader is confused.

Scorpio: 23 November - 29 November
Source of the sting in the tail is a poor result when famous ratio comes before zero.

Ophiuchus: 30 November - 17 December
Ouch, I push off a snake fighter. They'll fall upon an open empty space.



Sagittarius: 18 December- 18 January
Guitarists a bad form of a horsey hunter.

Capricorn: 19 January - 15 February
Sea-goat found in an Italian maize.

Aquarius: 16 February - 11 March
Sounds like a Royal helper for you and me to carry water.

Pisces: 12 March - 18 April
Fishy spices well-cooked. ■

Where there's a will...

Martin Hadley explains why it's important to look into your old testament before the clarion call.

Like many Australians, I made my first will many years later than I should have. It was selfish and I showed no regard for those who would have had to deal with the mess. A clear Will always makes it easier for them. But until my early 30s, I felt no risk of mortality. I should have heeded the advice of Barry McKenzie's mother (as she plied him with additional clean underwear, when he was about to depart for London): "No man knoweth the hour, dear."

Those in the know all agree: "Grownups, please make a will."' You should be able to find a friendly solicitor who will take care of you for a modest cost. I urge you not to try a DIY will or anything styled as a will 'kit'. People using them often overlook formalities with awkward results. Such as when a person who was supposed to receive a gift turned out to be one of the witnesses to the signature of the testator. But witnesses are not allowed to receive gifts. Sometimes such problems can be fixed, but even that will cost much more than the amount saved by being too mean to visit a solicitor to get the job done properly. I warn you that a DIY will is about as safe as a DIY self-assembled flamethrower.

I hope we now have some readers who have resolved to make their will. To 'those-about-to-testate' I offer some information to help you in your plotting. I wish to summarise how your wishes can be modified by legislation which kicks in after you have died. Every state has its version and they are broadly similar in operation. The legislation allows certain people to claim on your estate. Frequently, one or more people will succeed in persuading the court to rewrite your will, to some extent.

Fat books exist on the subject (and many fat lawyers ply their trade in this area, which is called "family provision"). As one such lawyer I can tell you these basic points.

The law allows certain people who had a close connection with the deceased (alas, that's you) to claim a greater gift than the will gives them. If a person fits into one of the possible definitions, they are an "eligible person". Most of the eligible persons are obvious, eg surviving spouses and kids. However, some are more distant than most readers would expect. Now included are same-sex partners, de factos, former partners and a slightly woolly class arising from being dependent on the deceased for a while, eg a grandchild who lived with the deceased at some time in the past.

We also see more claimants thanks to the proclivity of baby boomers to proliferate marriages and relationships. More children and step-children are connected to the contemporary loved one.

You cannot get around this law completely by fancy clauses in the will. However, there are some simple steps you can take to help ensure that your wishes are carried into effect.

Blackadder might propose a Cunning Plan: When you sense that the grim reaper will soon be attending, give away most of your assets to a friend with instructions of what to do with it. Your "estate" will thus be minimal. (This is a classic ploy for discreetly ameliorating the grief of mistresses or love-children.) Sorry, but sudden asset-strips just before passing over do not work anymore. The law can reverse such transactions if they have taken place within three years before death.

Left: Memento mori - The death clock in Prague.

DIVVYING UP THE GOODS

As to how claims are dealt with, there is no formula, eg that all kids get the same share. Nor does the court try to reward the claimants according to how they behaved towards you during your life. Right minded people are galled to be told that the need of the claimant is the main ingredient of this recipe. The role that merit plays in outcomes is debatable.

At crunch time it works like this. The people who can possibly make claims have received something or nothing under the will. The court considers whether they are in such need that whatever they got is "inadequate". You can understand that this word gives rise to a lot of argument and deliberation, according to the different circumstances of each case. If an eligible person is seen to need more, then the question becomes: How much can we take from the other beneficiaries? They may have their own needs. Sometimes everyone is a battler and there is not enough estate to make transfers. On other occasions, a person may lose all their share and see it transferred to someone whom the court feels is more needy.

Most lawyers think that the Family Provision laws work reasonably well, and certainly better than the alternative of no such laws at all. But not everyone is a winner. Take an example where the estate is going to two sibling children, now grown up and in their fifties. Frugal Smith has worked steadily. He has a reasonable house, some savings and some super. His brother, Feckless, has lived up to his name. He has next to nothing apart from lifestyle induced health problems. If the will splits the estate equally, then depending on its size, Feckless might have a chance of getting more than 50 per cent. Since Frugal is comfortable, his bequest can be reduced. In other words, the result is close to a person benefiting from their own neglect.

Indeed, Frugal is not in need and therefore he cannot make a claim, even if the will leaves him nothing. He could be excluded totally. If the testator expressed disapproval of Feckless by excluding him or reducing his share, then that would not stop the court finding him to be needy and giving him, theoretically, up to the whole estate. That can happen even when the testator has stated the reasons for their discrimination in the will. It is safe to generalise that, unless Feckless has behaved very badly towards the deceased, the amount given to Feckless will rise up to meet his perceived needs, unless you first reach the point where the other beneficiaries will become needy themselves.

> "Family Provision - fat books exist on the subject, and many fat lawyers ply their trade in this area."

CLOSE TO HOME

Astute readers may have twigged to why the treasurer of an organisation like the Australian Skeptics Science and Education Foundation Limited would be writing an article like this. Wills often make gifts to children and to charities. When the competition is between a needy Family Provision claimant and a charity, there is no sense of the charity being needy. The idea is that charities are not to expect bequests until needy eligible persons have been seen to. Your wishes as the testator are subservient to the court's perception of the needs of eligible persons. Too bad, you're dead.

As the legislation has been amended over the years, things have become better for Family Provision claimants. You can now understand why the biggest losers have been charities. Since a significant amendment 30 years ago, charities have copped it. In a recent example, the Foundation and another charity each received 20 per cent bequests, the rest going to relatives of the deceased. A former de facto put in a claim. When it was finally settled at mediation, and all the lawyers paid, the proceeds to the charities were halved. The wishes of a devoted subscriber were partly thwarted. (To clarify the above, in will cases, the term "charity" is used more widely and covers basically any worthy cause, regardless of its status with the taxman. For the record, neither the Foundation nor Australian Skeptics Inc are formally classed as charities as per Taxation Office rules, and therefore donors to either group are not eligible for tax deductions.)

To those-about-to-testate I say: "Take heart." You should be able to get cheap advice from a solicitor about how to consider the people who could make claims against your estate. Which people should be 'on your radar'? Most people will have a number of obvious potential beneficiaries. If you plan to give such a person a reduced share, then you can include your reasons in the will. Giving some reasons for the distributions in your will can significantly affect how a court adjusts it. Another positive step is to consider donations while you are alive. Once the three years have passed, these

the Logical Place

Rationality and truth

Until early December 2010, science told us that the element arsenic is toxic to all life on Earth, in even very small concentrations. But then NASA announced that scientists had discovered a microorganism in California's Mono Lake able to thrive and reproduce using arsenic instead of phosphorus in its biochemistry. Harvard philosophy professor Robert Nozick has proposed two criteria for rational belief:

1. support by reasons that make the belief credible (eg scientific evidence);

and

2. generation by a process that reliably produces true beliefs (eg the scientific method).

In terms of Nozick's criteria, it was rational until December 2010 to believe that arsenic is toxic to all life on Earth, even though we now know that the belief was false. Was it rational to hold this belief after the NASA announcement? Using the same criteria, our answer would be "no". Rationality is the state or quality of being rational, which means being consistent with or based on or using reason. Reason is thought by rationalists and skeptics to be more reliable in determining what is true, in contrast to reliance on factors such as authority, tradition, instinct, intuition, emotion, mysticism, superstition, faith or arbitrary choice. But as we have seen, a rational belief is not necessarily true. Conversely, an irrational belief is not necessarily false. For example, a prediction made by a psychic can turn out to be true. On the other hand, a rational belief needs to be reasonable or credible in the circumstances; that is, a rational belief is one that is justified by reason.
What we can say is that because an irrational belief is unreliable and more likely to be false than a rational belief, we should therefore be more skeptical about beliefs that are known to be or appear to be irrational than about rational beliefs.

- by Tim Harding

Where there's a will...

Continued...

are safe. The gifts cannot be reversed and your wishes cannot be defied.

It is understandable that people with a favourite charity usually see their will as the best way of helping. We may not know when we are going to die but whenever that is, we won't need the money and the charity is welcome to it. This assumes that the charity will cope in the interim. Also, some people feel self-conscious about making gifts.

It is sound estate planning to consider what you might be able to give while you are alive. Not just to charities but also to those who might find their shares reduced in a Family Provision claim. One technique is to put aside what you expect to need for living expenses for a period. If at the end of that time you have some funds remaining, then you could donate that. If it turns out you had to spend all the money, then no harm done.

Active skeptics strive to make a difference. With the exception of one person, they are unpaid, and even that one person is not paid enough to keep them in boundless luxury. Active skeptics will appreciate any support you can give, through the Foundation and the branch committees. And it is nice to think that the supporter is still a warm body, instead of a lost friend. ■

Note: This article arises from my own legal experiences. For more detail on Family Provision and the plight of charities, see this excellent paper: McGregor-Lowndes, Myles and Hannah, Frances M. (2008) Every player wins a prize? Family provision applications and bequests to charity. The Australian Centre for Philanthropy and Nonprofit Studies, Brisbane, Queensland.

About the author: **Martin Hadley** is treasurer of the Australian Skeptics Science & Education Foundation.

The Cat's Miaow

Max Roberts reports on his least favourite dishes – cat food.

Look, it's hard enough being a cat, especially here in Skeptical Steve's house, but the worst thing is that he doesn't believe that I can read and write English. He thinks all I do is chase birds, leave hairs on the furniture and pick threads from the carpet. But I'm very erudite. I even appreciate his books; my favourites are Catullus, *Catcher in the Rye, Catch-22*, the IKEA Catalogue, *Catpain Corelli's Mandolin*, *Lady Catterly's Lover*, etc. I also chew the blue Cat 5 cables from his computer.

But what I really want to tell you about is the food. Every day he dumps something in the bowl for me to scoff - and who knows what it might be. I mean, what is this stuff? The makers' websites refer to "Wet Cat Foods" - for wet cats, surely - or, would you believe, "Adult Products". So let's have a closer look at the labels.

Here's today's: Casserole with Lamb and Turkey. Carefully *not* labelled as "Lamb and Turkey Casserole" - no, evidently they must make a casserole of something else, industrial slag or plutonium possibly, and then add some lamb and turkey to it. But how much is "some"? And what parts of the lamb and turkey are used? And why this curious alliance of beast and fowl, a combination not normally found in cuisine. What I reckon is, various animals were running around the cat food factory, it being a bit chaotic at the time, what with giant cauldrons all boiling and splattering away; a sheep chased after a turkey and both fell into a pot where a couple of megalitres of glop were stewing. "Now what will the boss say!", said the foreman. "I know. Let's say we were making Casserole *with* Lamb and Turkey. And while we're at it, cauldron #7 near where the cow and some hens went missing yesterday - we'll call that Casserole *with* Beef & Chicken. Sounds better than Boiled Offal with Sulphur Dioxide … yeah, ring up Marketing and tell them."

Yesterday I got Casserole with Sardine, Salmon, Chicken and Vegetables - there must have been a complete disaster at the factory. And last week he dished up Loaf with Lamb and Kidney. This seems a bit redundant. Don't lambs have kidneys already? There's also Loaf with Chicken and Turkey, which is what the boss probably said about one of the lazier workers and his cowardly and useless mates. Then, probably due to the way another bloke walked, there's Mince with Minced Beef.

Now let's see what's in the food cupboard: Classic Pâté Chicken and Tuna Dinner. That one should consist of chickens and tuna, and pâté? No, no, it *is* pâté, with an unquantified presence of the respective fowl and fish. It could be 99.9 per cent bandicoot pâté. And doesn't "classic" mean "very old"? Here's one called Natural Sensations with Real Salmon, which implies much about foods containing "salmon" not so adjectivally qualified. Party Mix Beachside Crunch - probably crunchy because it has sand in it. Party Mix Wild West Crunch - eh? - that would have lead in it. And here's Saucy Seafood Bake - when he opens the packet a fish will pop up, pout and say "Hello sailor".

Then there's the dried food: "Bites with Ocean Fish Flavour". While eschewing to inquire what the Bites are primarily Bites of - asbestos, maybe - we hazard that a beaker of laboratorial flavoroidal synthezoetopical chemicals is thrown in, to impart that fishy fish flavour. Not that I have any idea what a fish tastes like, as he doesn't have a garden pond. Here's "Bites with Chicken, Turkey, Vegetable and Cheese Flavour" - that'd be for cats that like chicken, turkey, vegetables and cheese, all at once. Whatever those are.

Look, everyone knows what I really like is mice, rats and birds; they ought to make "Sludge with Rats". An occasional Leadbeater's Possum or Orange Bellied Parrot would be exotic. Why can't they put those in cat food? They'd probably only need one. ■

About the author: **Max Roberts** has a Doctorate in Divinity from a university that has nearly been awarded an accreditation. This article was translated and transcribed by his servant, Steve Roberts.

Back and Forth with

Richard Saunders describes the trials and tribulations (and the thrills) of being a travelling Skeptic. We feel sorry for him!

July 2011 was an exciting and busy time for your correspondent. I was half way through filming The One, the TV series in which I appeared as the skeptical judge, when TAM (The Amazing Meeting) in Las Vegas rolled around once again. I have not missed a Vegas TAM since my first visit there 2008 (I was thrilled to be guest speaker) and was very keen to at least show up in 2011.

However, this came at a high price and I don't mean the airfare. As I boarded the plane in Sydney, I knew that in a couple of days I would be disembarking (or deplaning as our American cousins say) back in Sydney. This was all the time the Seven Network, producers of *The One*, could afford to have me away from the show as not only did I have a role on-screen, I was also working behind the scenes as an adviser.

FROM LAS VEGAS ...

The Amazing Meeting 9 is not something that particularly lives in my memory. Why? I think it's something to do with that bizarre mix of jet-lag and adrenaline. After a 14 hour flight to LA, a 3 hour stopover, another 1 hour flight to Las Vegas, a 20 minute wait for a taxi, a 20 minute ride to the hotel, a dash to my room to clean up, I at last hit the convention proper.

This is where the high price I mentioned before starts to seek payment.

I was thrown into a whirlpool of meeting people, top of the list was James Randi himself, as well as photographs, doing interviews for *The Skeptic Zone podcast*, being interviewed by others, trying to catch some of the talks, taking part in a panel, more photographs (in fact I am grateful for all the people who took photos of and with me... it's one of the only ways I have to piece together my visit!) and on it went. Later that day I was even the guest auctioneer at *The Skeptics' Guide to the Universe* dinner!

This wonderful madness lasted less than 48 hours. Before I knew it, I was back on that plane heading home with only a day to recover before continuing my TV duties.

> "The 'choir' is always in need of more practice and more information. I am in their ranks, learning by listening."

I can tell you with great authority that humans are not evolved to cope with the sudden shifts in time that cause jet-lag. (One wonders how the companions of Doctor Who manage!) I don't seem to have been able to form and keep memories of my much of my time in Las Vegas, hence the reliance on photographs. There is even a photo of me having a deep and meaningful with Dr Richard Wiseman, a man for whom I have great admiration, but alas I have no memory of the conversation at all!

Getting back to the high price, for me part of it was the mental and physical daze that lasted even after I returned home and the loss of memories, and a TAM should leave many of those.

... TO NEW ORLEANS

But all was not lost. I knew that in October the Committee for Skeptical Inquiry or CSI (formally known as CSICOP) were to hold CSICon, their first major convention for many years. The same organisation had only recently honoured me by making me a Fellow. The promised line up of speakers, including Joe Nickell, Rebecca Watson, James Randi, Dr Phil Plait, Dr Eugenie Scott, Dr Steve Novella and many more, whetted my appetite. How nice it would be to attend a convention and have time to take it all in and enjoy the presentations. I wrote to CSI and informed them of my intention to

Rocks

Below Saunders and Dunning at Bad Water (the place, not the drink).Photo thanks to a passing tourist.

attend and wondered if they could make use of me. I was delighted to be offered a speaking slot on the main stage and to have my convention ticket and hotel costs covered. I was on my way to New Orleans!

This second trip to see Uncle Sam could not have been more different.

I spent the first five days visiting my in-laws and getting over jet-lag in the San Francisco Bay area. Then a relaxing flight to New Orleans and a bumpy but cheap bus to the convention hotel where I was greeted by a chorus of cheers from the bar as I checked it to see who was there. (Always a good sign.) I was soon catching up with people I seem to only see at conventions who were keen to chat to me about the latest goings on and gossip in the skeptical world.

The four days or so days of the convention were packed with talks and events, lunches and dinners, meetings and drinks. Somewhere in the middle of it all I found time to jump on a tram with Dr Phil Plait (known as The Bad Astronomer) and friends and headed out into the great unknowns of New Orleans, ending up at one of those family-run restaurants where we dined like royalty. The tram back to the hotel was stuffed full of 20-somethings, all in fancy dress (if one can still use that term) and ready for a night on the town.

But the real joy of being in New Orleans was the convention itself. What a pleasure it was to sit in the audience and soak up the talks by some of the world's leading thinkers.

This brings me, for a moment, to the topic of "preaching to the choir", the complaint that skeptical conventions are a waste of time as they are not reaching anyone new, just more or less people who 'get it' anyway. To that I say that the choir is always in need of more practice or in this case in need of more information. I myself may well lead the choir in the odd song or two, but for the rest of the time I am in their ranks, learning by listening to those other choir leaders. This, for me, is vital and far from a waste of time.

Getting back the convention, my only grumble is that there was so much going on, the organisers had to run concurrent sessions. More than once I was torn as to which talk to attend and which to miss. But that is a small gripe and one that did not really detract from the enjoyment.

The convention ended with a 'Houdini Seance' in which Joe Nickell, Masao Paladro and Ray Hyman gave an overview of the life of Houdini and the history of the annual Halloween seance in his honour.

... AND THE ROCKY RACETRACK

Off to the airport again. This time my destination was Los Angeles to meet up with fellow skeptic Brian Dunning from the well-known *Skeptoid* podcast. Brian had promised to take me on a trip to Death Valley to see one of the real mysteries of the world, the moving rocks at Racetrack Playa. (A quick Google search of will provide you with many photos and videos of this wondrous place.)

We drove to Death Valley National Park a few days after my arrival and stayed in a hotel at a tiny place called Stovepipe Wells Village. Death Valley National Park is, in a word, huge. One cannot see all there is to see in a few days or I dare say a few weeks. On the one day Brian and I encountered a stinging sandstorm and then snow as we drove through a naturalist's wonderland of differing terrains, vegetation and altitudes raging from 86m below sea-level (yes... below) to over 2000m above. A short video clip of Brian and a 'gravitational anomaly' can be seen on YouTube at http://tinyurl.com/7kwtbzv

But all this was really the curtain raiser to our ultimate goal, the Racetrack. Brian had been there a few times over the years, but for me it was like visiting the moon. The Racetrack itself is a large flat lake bed, or playa,

Back & Forth with Rocks

Continued...

with light grey dried mud. Dotted about the playa are stones and rocks ranging in size from that of a cricket ball up to that of a small wheelie bin. What makes this place stand out is the fact that these stones somehow move across the playa, leaving long eerie trails in the dried mud. (Again you can see many photos of these stones and tracks with a Google search.) As far as we know, no one has ever seen the stones moving, hence the mystery. Brian and I walked out into the *playa* to examine the stones for ourselves. What a thrill it was to visit a world renowned mystery spot to find ... a mystery! (Unlike every so-called haunted house I've been to where the only danger is dying of boredom.)

We stayed as long as we could to study the scene and take a close look at the tracks. Sadly, this was only about 25 minutes as the bitter cold and strong biting wind took their toll. We were both quite numb to the extent that using camera equipment soon become too difficult. However, you can see some of our sojourn in a short video we made and uploaded to YouTube (http://tinyurl.com/772np3h).

Brian has come up with a very good theory as to how the stones move, one that has even made its way onto the information plaque at the Racetrack itself. In brief, if water from rain or snow-melt covers part of the playa, it can very easily turn into a large sheet of ice as temperatures drop below freezing. If a strong wind blows, the ice sheet could move slowly, dragging/pushing any stone in its way or indeed any stone that has become encased by the sheet of ice. I can attest to both the freezing conditions and the force of the wind. The closest anyone has come to seeing this in action was Brian himself who made a short video of the moving water which can be seen on his web page along with more explanations (http://skeptoid.com/episodes/4021)

Death Valley reminds me of the saying "why gild the lily?" It is a place of true wonder and beauty and, as if that were not enough, a fascinating mystery to boot.

This year I will again attend TAM in Las Vegas and will make every effort to attend CSICon in New Orleans as well. I would never rule out another trip to Death Valley but I hope my readers will considerer going for themselves to experience some of the best scenery our planet has to offer. If anyone has a cure for jet-lag, I may even offer you the Skeptics' $100,000! ■

Above: Brian Dunning with a friendly local
Photo by Richard Saunders

About the author:
Richard Saunders is a life member and a vice-president of Australian Skeptics, a Fellow of CSI, and producer of The Skeptic Zone Podcast (www.skepticzone.tv).

Dead Eyes Pete from Canberra

Dr Ian Peter (Pete) Griffith, a prominent member of Canberra Skeptics and president from 2002-5, died on 10 December 2011. His career as a microbiologist made him a strong proponent of immunisation, and Pete gave regular talks on this and other issues during his membership of the group. And, on occasion, he jotted down a poem or two. Below is one of his best. A memorial service was held for Pete in the National Botanic Gardens on 5 February 2012. He will be missed at Canberra Skeptics.

A skeptic mob in Sydney says that psychics are all bent
Just like the spoons, they reckon, of that Uri Geller gent.
You can't, they claim, divine for gold, or even dowse for waters
So codgers saying that they can are monumental rorters.

For those who've got the dowsing knack there's money for you whackers:
They've challenged you to win the prize – a hundred thousand smackers.
Or thereabouts – it may be more, it seems quite recently,
They've upped it by some ten percent to cover GST.

First you've got to demonstrate your method is quite sound
By plotting out, upon a chart, the water underground.
And then from flasks in paper bags they've scattered on the land,
Pick eight or so with water filled from twelve or so with sand.

Million to one (or thereabouts) by chance are deemed the odds:
To win it seems you've got to use real special dowsing rods.
Now psychic gifts, I've got just none – the lousiest of dowsers –
But with science on my side, I'll beat those Sydney wowsers.

I hear at Mitta Mitta at the muster once a year,
The dowsers come to test their skills on all that bottled gear.
So off I writes to let them know I'm really on the ball,
I'm Dead Eyes Pete from Canberra who cannot see at all.

The card – I wrote – I need to score, I clearly cannot see,
So one in Braille would be the shot, especially that for me.
The brief reply was to the point, they said that "They'd provide
A fully sighted skeptic cove to act as dowser's guide".

Your guide, I wrote, is just not on, he would affect my aura,
So as I go I'll keep my score upon a tape recorder.
To this they said "The rules are clear: no aids but rod'n'robe;
Or else some dodgy codger 'ud employ a sonic probe."

No sweat, I wrote, I'll go the round, and tally in my head,
But I will need to bring my dog to help me round instead.
They rang and lisped that "In the patht, thingth thometimth went amith
When flathkth thet out upon the grath were uthed by dogth to raise a leg".

"Guide dogs" I cried "are trained to be more choosy where they leak,
But if it helps, I'll keep him dry, and grogless for a week".
Which was agreed. With glasses dark, a harness for the critter,
And dowsing rods (all painted white), we both set off for Mitta.

The challenge day dawned crisp and clear with forty dowsers' auras –
Or, more like, the mounting fumes of eighty armpit floras.
They did their bit – some fast some slow – and then the dog and me
Set off upon the challenge round without a single pee.

At every stop I twirled me rod, gazed sightless at the judges,
Dropped to the turf upon my knees – I've got you now you bludgers!
Bowed to the north, east, south and west, sniffing bags but gave no sign
Which were the spots the grogless dog let out a thirsty whine.

The time had come to check the score: I told 'em what I'd got –
Which of the flasks had water in and which had not a jot.
The skeptic mob just looked aghast: beards turned white 'n' faces red,
"A perfect score is just not on. There's been some trick," they said.

"No trick's involved, just skill." said I, "But when I've got me dough –
The pub is flush, they'll cash the cheque – I'll tell you how I know.
As I am blind my sense of smell is very much the part:
Sand from water I can tell, like fresh air from a far…mer's cart".

Now this of course is total crap – my nose is made from wood –
It couldn't pick those flasks at all. But know I one that could?
"The dog deserves a beer," I cried "He hasn't drunk in days;
He did a ruddy mighty job around that bottle maze".

Then dog and I jumped in the ute and drove into the night.
A hundred thousand smackers, mates, does wonders for your sight!

Unfounded fears of the flannelled fools

Introducing a new series of classic articles from the Skeptic archives. Kicking us off from 1993, Barry Williams on a subject close to his heart: superstition, statistics ... and cricket.

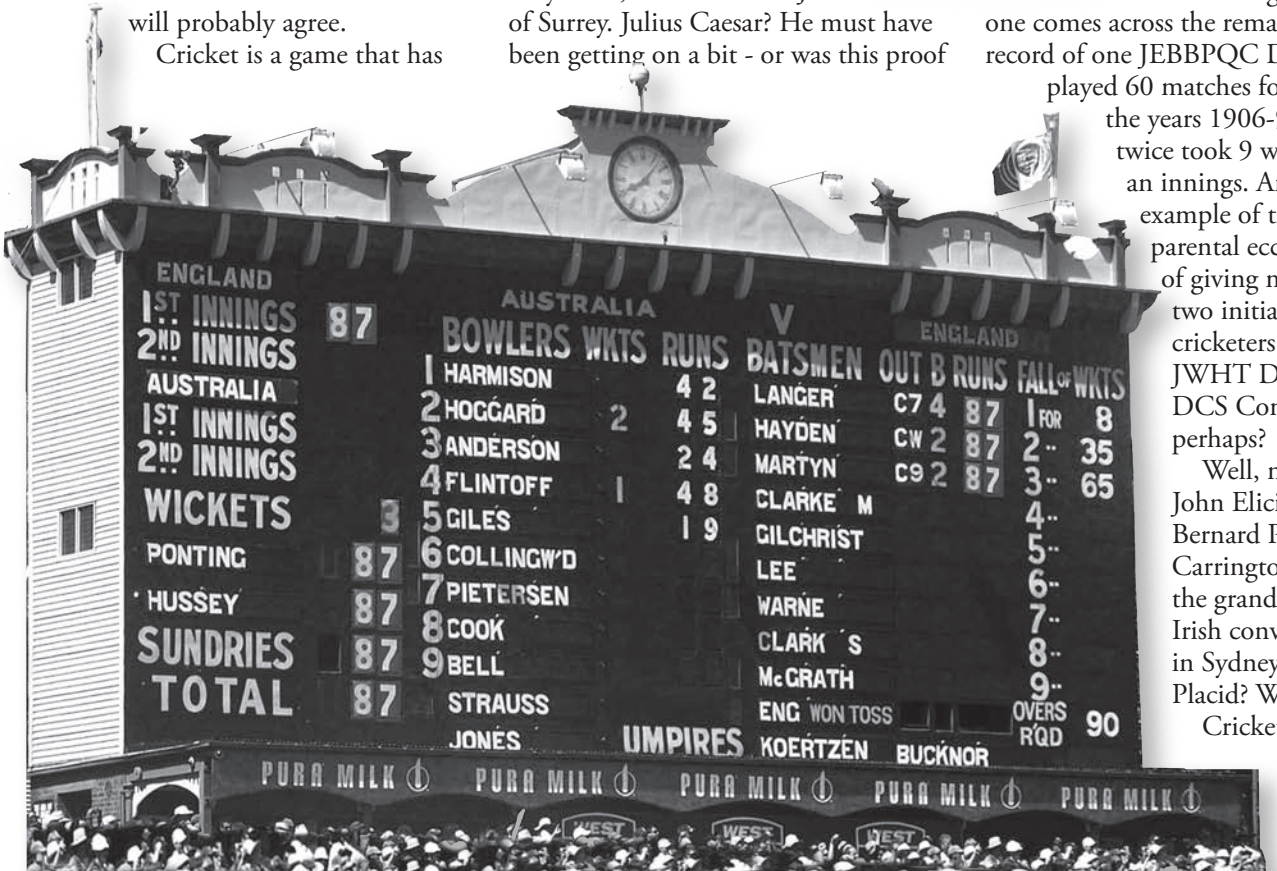
Cricket, as generations of commentators from the SCG to Sabina Park, from Lords to Lahore, have never tired of iterating, is a funny game. And I have no doubt that even in Holland, which once (but no longer) revelled in the record of having a 100 per cent success rate against Australia, some Netherlandish Bjil Lawrij has more than once delivered himself of the observation, "Krijkit is a funnij gejm". Our many readers who have nominated the game of the flannelled fools as one of their interests will probably agree.

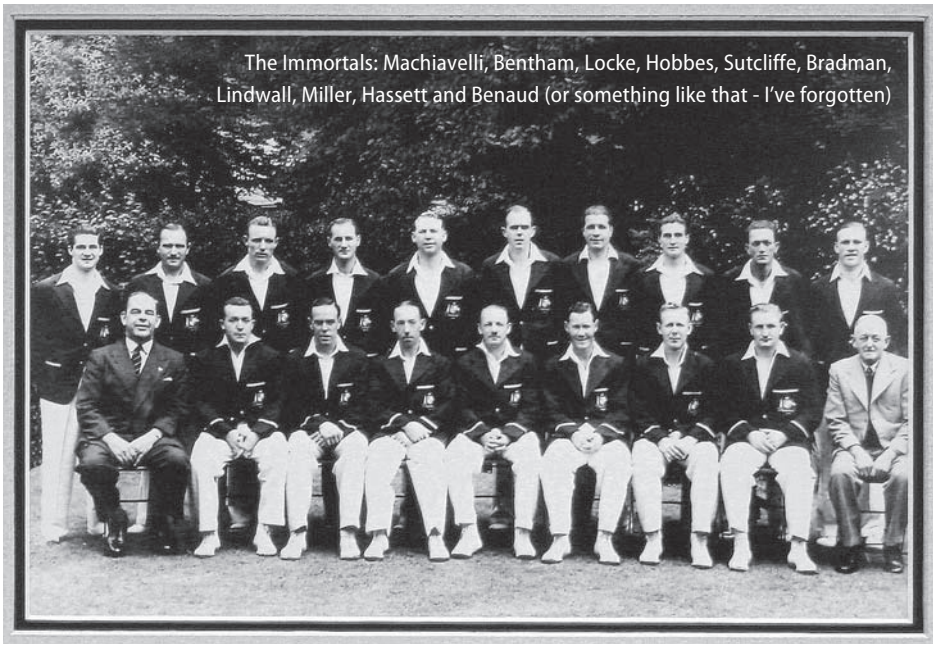
Cricket is a game that has inspired more prose and poetry than any mere sport; cricket doesn't have rules, it has Laws; cricket offers more statistics than a politician at election time. And it is in cricket's statistics and folklore that the dedicated devotee can find hours of innocent enjoyment.

For instance, in what other field of esoteric knowledge could one glean the intelligence that a team of English professional cricketers who visited the United States in 1857, under the managership of a certain Fred Lillywhite, contained one Julius Caesar of Surrey. Julius Caesar? He must have been getting on a bit - or was this proof of reincarnation? And what of CB Fry, who, around the turn of the century, held the world long jump record, played soccer for England, played in 26 test matches for England and is alleged to have been offered the throne of Albania. How many tennis players could match that? Delving further, one comes across the remarkable record of one JEBBPQC Dwyer, who played 60 matches for Sussex in the years 1906-9 and who twice took 9 wickets in an innings. An extreme example of the English parental eccentricity of giving more than two initials to future cricketers (PHB May, JWHT Douglas, DCS Compton et al) perhaps?

Well, not really. John Elicius Benedict Bernard Placid Quirk Carrington Dwyer, the grandson of an Irish convict, was born in Sydney in 1876. Placid? Wow!

Cricket consists





The Immortals: Machiavelli, Bentham, Locke, Hobbes, Sutcliffe, Bradman, Lindwall, Miller, Hassett and Benaud (or something like that - I've forgotten)

of a series of Golden Ages, which have nothing to do with the New Age, but refer to the cricket played when the cricketophile was 10 years old. Who could forget the unbeaten 'Immortal' Australian 1948 touring side? Where others tried to remember the Seven Dwarfs to win a bar-room bet, the pre-war baby could rattle off Bradman, Hassett, Barnes, Morris, Harvey, Brown, Miller, Lindwall, Tallon, Johnson, Johnston, Loxton, Toshack, McCool, Saggers, Ring and Hammence, without looking at a book (and still can!).

[When I wrote this in 1993, more than half The Invincibles were still with us. Now only two remain, Arthur Morris and Neil Harvey. - BW]

Bradman! Every devout cricket lover knows Sir Donald Bradman's test batting record as well as the Christian knows the Apostle's Creed: 52 tests; 80 innings; 10 not outs; 334 highest score; 6996 runs; 99.94 average; 29 centuries. And the lore. Needing only 4 in his last test to finish with an average of 100, he was bowled second ball by a googly from Eric Hollies for 0. His average is more than 50 per cent higher than the next best. He scored a century or better every third innings. He still shares several test wicket partnership records, including the highest of all, 451 with Bill Ponsford for the second wicket, against England in 1934 (59 years ago). [This record for the second wicket was surpassed by two Sri Lanka batsmen against India in 1998 and now stands at 576. The record score for any wicket - the third in this case - is now 624, set by another two Sri Lankan batsmen against South Africa in 2006 However Don Bradman and Sid Barnes still hold the fifth wicket record of 405, set against England in Sydney in 1946-7.] But only the truly devout could tell you The Don's test bowling record (160 balls; 3 maidens; 72 runs; 2 wickets; 36.00 average.) And who were these two victims (a guaranteed free beer in any bar for knowing this)? George Nathanial Francis (West Indies) lbw Bradman 27, 1st Test, Adelaide, 1930; and the great Walter Hammond (England) bowled Bradman 85, 3rd Test, Adelaide, 1933 during the infamous 'Bodyline' series. There must have been something in the Adelaide wicket that suited The Don's bowling.

Now hang on a bit, I hear the gentle reader cry, just because he is [was!] the editor, how can he justify inflicting this harangue about cricket on us? After all, this is a journal dedicated to exploring the mysteries of the paranormal and pseudoscience, not the arcane lore of leather and willow.

There is nothing paranormal about cricket unless, as an American is once alleged to have said while watching a test match, it is proof of eternity. Well, let me tell you, there is a relevant point to all this and I have just been setting the scene. And, as everybody knows, if there is anything you can accuse a cricket buff of, it certainly isn't reticence.

> "It is in cricket 's statistics and folklore that the devotee can find hours of innocent enjoyment"

THE RUN UP

What brought me to this happy state was hearing one of the ABC cricket commentators during the 1992-93 West Indies tour discussing the notoriously unlucky score for Australian test batsmen of 87. This is a recurring story, and even today you can still hear the likes of Tony Greegg describing the tension in the air at this score – you can cut it with a knife!

Back in the 1970s, pre-Skeptics and pre-computers, I had sought to discover the truth of this superstition, whether in fact Australian batsmen had a tendency to be dismissed more frequently on 87 than on other scores in the 80s. Since then, I have lost my data, but I can vaguely remember that there was no particular concentration of dismissals on that score.

Readers will appreciate that it was no simple matter to research every score made by every Australian batsman in the 520 test matches they had played in, from the first in 1877 until the lamented last test of the 92-93 West Indies series. First to my local library to search *Wisden's Book of Test Cricket*, which lists all test matches between all countries.

But where to begin? Clearly it would take at least as long as the famous 'Timeless Test' - England v South Africa, Durban, 1939, match abandoned and declared a draw on the tenth day of play because the England team had to board their ship home - to list every score, so I decided to concentrate only on those between 70-100. Additionally, I sought the times when a wicket fell when the team score stood at 87.

This research enlivened my lunch hours for more than a week, but was

Unfounded fears of flannelled fools

Continued...

Below: Cricket umpires as they should be - with frock coats and guns.

inconclusive because the Wisden in my library listed tests up to 1985 only.

Where next? A call to the NSW Cricket Association to seek access to more current books elicited the information that the Association's librarian, Ross Dundas, should be able to help with my quest. Mr Dundas' name was not unfamiliar, as I had seen his imprint on a number of books of cricket statistics, so I called him. Not only did he have statistics on all the tests up to and including the latest, but he actually had a computer listing of the number of batsmen who had made every score that had been made from 0 to 334 (Don Bradman, A v E, Leeds, 1930). [This is no longer the highest individual Australian score. Since then, another score of 334 (not out) was made by Mark Taylor against India and Matthew Hayden scored 380 against Zimbabwe.] Would Dundas make his list available to me? Of course he would; when cricket nut talks to cricket nut, nothing is too much trouble.

What was the result, I hear you cry? Patience, dear reader, patience - triple centuries are not made in a day (well, not often at any rate – Don Bradman at Leeds, 1930, made 309 in one day, the only time this has been done in test cricket). While searching the figures for my primary objective, I came across some other intriguing statistics, which I am sure will interest my fellow cricketophiles among the readership. Some of these should certainly be useful for baffling the fellow next to you in the pub.

The lowest score at which no Australian has ever been dismissed is 139, although one batsman has been left on 139 not out. The lowest score that has never appeared in the scorebook beside a batsman's name is 148, while no batsman has ever been out for 150, though three have been left not out on that score. Between this score and 200, eight scores have never been made: 174, 175, 180, 186, 194, 195, 197 and 199. [Short of carefully combing through the scorecards of every test played since 1992, I am unable to decide which of these scores remains unblemished, but I suspect few of them still stand. However, one score that until recently remained the lowest score that had never been achieved by anyone anywhere was 329. Michael Clarke put paid to that record in the 100th test match played at the SCG, in the New Year Test against India in January this year.]

I could have gone on forever, teasing Mr Dundas' figures for the odd result, but still no nearer discovering why 87 had attracted all the attention. I had some figures to work with, but I had not come any closer to finding why Australian commentators (and presumably players) thought this particular score was unlucky. Some suggested that it was because the score was 13 short of a century, but then 13 should be a particularly unlucky score and, thanks to Ross Dundas' figures, I could see that 151 batsmen had been dismissed for 13, while 159 had made 12 and 158 had reached 14. The most unlucky score of all, of course, is 0, the dreaded 'duck' - 947 players have scored this non-score, 11.75% of all Australian test innings. [All of these figures are in need of updating – any volunteers?]

MILLER, KR, B WILLIAMS, BJ

It was at about this time that there occurred one of those coincidences that makes even the most hardened sceptic think that there must be some underlying purpose to the universe after all. In the February 6, 1993 issue of the *Sydney Morning Herald's Good Weekend* magazine, well known sporting journalist and author, Philip Derriman, had written an article about Harry 'Bull' Alexander, a Victorian fast bowler and then Australia's oldest surviving test cricketer. Alexander played in only one test match, the last of the 1932-33 Bodyline Series, and is remembered for hitting England captain Douglas Jardine several times during the match. Jardine was as popular in Australia as ... well, he wasn't popular at all. Hitting Jardine was considered a justifiable activity.

In the course of the article, Mr Derriman referred to Bull Alexander's career as a Victorian Sheffield Shield bowler and how he dismissed the then young Don Bradman in a match in Melbourne in 1929. Watching the match was a ten-year-old boy called Keith Miller and, according to the article, this dismissal was the genesis of the superstition about 87. As Miller grew up and began to play cricket, the Bradman

87 stayed in his mind and he noticed how many other club or state players with whom he played seemed to go out at the same score.

Intrigued, I contacted Derriman and mentioned my interest in this superstition. He suggested I call Keith Miller and ask him about it. Now, if Don Bradman is a deified figure to cricketophiles of a certain age, then Keith Miller is at least a demi-god. A natural cricketer, outstanding with both bat and ball, Miller was probably the greatest all rounder in Australia's cricket history. Faced with the choice of two cricketers to play for my life, I would unhesitatingly select Keith Miller and Sir Garfield Sobers of the West Indies. When I was ten years old, I didn't want to grow up to be like Keith Miller, I wanted to grow up to be Keith Miller (regrettably my talent did not match my enthusiasm). Now, more than 40 years later, I was about to speak to the man himself. [And now, 20 years farther on, neither the Don nor 'Nugget' Miller is with us.]

It was obvious that the decades since Keith had played test cricket had not diminished his interest in the Great Game. He was very willing to discuss his career and answered a couple of questions I have wanted to ask him for many years. Yes it was true, as I had read in some book, that he had whiled away his time in the field whistling Beethoven symphonies and yes, he had, as a WWII RAF Mosquito pilot, diverted one of his return flights via the German city of Bonn, so he could see where Beethoven was born.

Having cleared up those vital cricketing points, I asked Keith about his role in the 87 affair. Yes, he had watched Don Bradman bowled for 87 in a Sheffield Shield match and he had retained that memory when he later began to play club, state and test cricket and he had noticed that this number seemed to occur more often than chance would dictate. He also said that he attributed this to nothing more than an interesting quirk and was surprised to hear, sometime during the 1970s, ABC commentator and former Australian batsman Paul Sheahan, discussing why the score of 87 was considered to be the Devil's Number. He attributed to Sheahan the suggestion that it was because it was 13 short of a hundred.

> "A good cricket story is not put to rest until we have milked every fact from it."

However, as the figures below will show, Keith Miller was suffering from a delusion that is very familiar to all Skeptics – confirmation bias. If you expect to see some pattern in anything, then you will see it and will ignore those events that don't conform.

But an even more astonishing fact arose in recent years when Keith was discussing his part in the history of the superstition with Philip Derriman. He referred to his 1929 watching of the dismissal of Don Bradman by Bull Alexander and, trying to ensure he had all the facts right, he looked up the scores for the match. There it was, in black and white. Bradman, bowled Alexander 89. What? 89? Keith believed that Bradman had been on 87 when he last looked at the scoreboard and this number had stayed in his mind throughout the intervening time.

As of 1993, only 10 Australian test batsmen had achieved the score 87. (The list actually shows 11, but someone did it twice.) Much more common scores in the vicinity were 85 (18), 83 (16), 88 (15), 89 (14), 92 (13), and 100 (17). Curiously, 17 players have also scored 112, when most of the scores around that figure have been achieved by only 6 or 7 players. Incidentally, I also checked on how many wickets had fallen in an Australian innings when the team score stood at 87. The total was 18, the lowest number for any score between 80-100. The highest number, 34, was when the score stood at 97. [Again, these figures could do with some update. Still looking for the volunteer!]

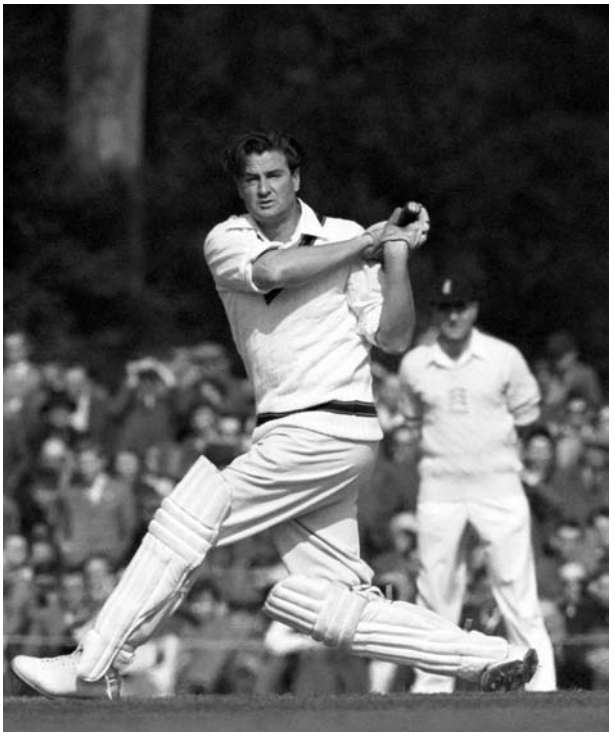
Thanking Keith for his time and information, I asked for his address so I could send him a copy of the article and was astonished by yet another amazing coincidence. He lived but a few doors away from the then Australian Skeptics secretary, Harry Edwards. It would be nice to be able to report that he lived 87 doors away, but it isn't true.

THE SCORECARD

But a good cricket story is not put to rest until we have milked every fact from it. So let me tell you who were the Australian batsmen who fell at the Devil's Number. The very first was George Bonnor who was dismissed for 87 in the Sydney test against England in 1883. It was Bonnor's second highest score in 17 tests, so could hardly be considered unlucky. Australia won the test by 4 wickets.

The second was Sammy Jones in the Manchester test against England in 1886. Jones, who lived to be 90, was the last survivor of the 'Ashes' test of 1882. In 12 tests, 87 was Jones' highest test score. In this innings he was bowled by none other than Dr WG Grace. England won by 4 wickets.

In 1902, Clem Hill achieved the score against England in the Melbourne



Left: Keith Miller in action, no doubt planning on scoring 87 just like his hero Bradman (who didn't).

Unfounded fears of flannelled fools

Continued...

test, which Australia won by 32 runs and he did it again in the Sydney test of 1907, which Australia won by 2 wickets. Clem Hill played 49 tests for Australia, including 10 as captain. In the 1902 series, he achieved scores of 99, 98 and 97 in successive innings. While captain, he indulged in a bout of fisticuffs with a fellow selector and retired from test cricket shortly thereafter.

The immortal Victor Trumper was next to achieve the score, in the 1910 Melbourne test against South Africa. Australia won the match by 86 runs. Trumper, probably Australia's second most revered cricketer, played in 48 tests and died of Bright's Disease at the tragically young age of 37.

Next in line was Jack Ryder, who made 87 against England in Adelaide in 1929. He played 20 tests for Australia, five as captain and was a long serving selector in the post WWII years. England won this test by 12 runs.

Twenty years were to pass before the score was achieved again, this time by Jack Moroney in a test against South Africa in Capetown, which Australia won by 8 wickets. Moroney made a century in each innings of the Johannesburg test in this series and made a duck in each innings of the first test of the next season against England in Brisbane. This may be the only time a batsman has achieved this double double distinction. He played in seven tests for Australia.

Brian Booth was the next to make 87, in the drawn Sydney test against South Africa in 1963. Booth, a classy batsman, also played hockey for Australia in the Melbourne Olympics. He played 29 tests, two as captain.

The next to achieve the score, and perhaps part of the continuing mythology, was ABC commentator Keith Stackpole, against England in the drawn Adelaide test of 1972. An aggressive right-handed opening bat, Keith Stackpole played in 43 tests.

John Dyson made his 87 against Pakistan at Karachi in 1982, a match Pakistan won by 9 wickets. Dyson played 29 tests for Australia and took one of the finest catches I have ever seen on an Australian ground, which various commentators ascribed to the fact that he was also a soccer goal keeper.

Spinner Peter Taylor, who retired in 1992, just prior to this article being written, was the last player to date to make 87, in the 1990 Wellington test against New Zealand. It was Taylor's highest test score in test cricket.

But we could not allow this to conclude without reference to the only Australian player to have achieved 87 not out. This was none other than that renowned pigeon fancier and Channel 9 commentator, William Morris Lawry, in the 1963 drawn Brisbane test against South Africa. Bill Lawry played 68 tests for Australia, 27 as captain.

Time, as is its wont, moves on and in the two decades since this article was first published in *The Skeptic*, two further examples of the 'Devil's Number' have occurred.

In the fifth test against the West Indies in Sydney in 2001, the extraordinarily accomplished wicket keeper/batsman, Adam Gilchrist, achieved the distinction. Gilchrist, whose batting was a delight for every cricket lover, played 96 tests.

Then, in the third test against India, in Delhi in 2008, Australia's captain and record run scorer, Ricky Ponting made the most recent departure at 87. Ponting, one of the all time great batsmen and inspirational fielder, has played in 162 tests, so far.

It is interesting to note that Alan Border, former Australian captain and then world record test run scorer, had never in 139 test matches and 10,000 plus runs, been dismissed for 87 in a test match. No one has ever scored 87 against the West Indies, India or Sri Lanka. [Sri Lanka remains the only one of this list, but as Bangladesh and Zimbabwe have since been added to the test playing nations, the total remains at 3.] In fact, 87 appears to be score achieved by fewer batsmen than would be expected by chance and, as shown above, with three of the 13 scores either the highest or second highest score made by the player concerned, not a particularly unlucky one.

If one had to select an 'unlucky' score for Australian test players while within sight of a century, then 85, 88 or 99 would appear to fit the bill better. And what about the 'ton' itself? No less than 17 players have been dismissed on that score.

And so, since the first batsman was bedevilled by 87 until the present, 13 men have achieved it in 128 years - averaging once per decade. But during the past 30 years many more test matches have been played every year than in the 19th Century, so it is probably safe to say this score will become less devilish as time passes.

I may have taken a long and circuitous route to reach this conclusion, but that is the way we cricket cranks are. As a result, perhaps I have helped lay to rest one of the more curious and lasting superstitions that infects cricket and showed it to have little more substance than most other irrational beliefs. But I would not bet the mortgage on it, for, as that commentator nonpariel Ritchie Benaud has been heard to observe on more than one occasion, "Cricket is a funny game". And the immortal Ritchie is still around saying it.

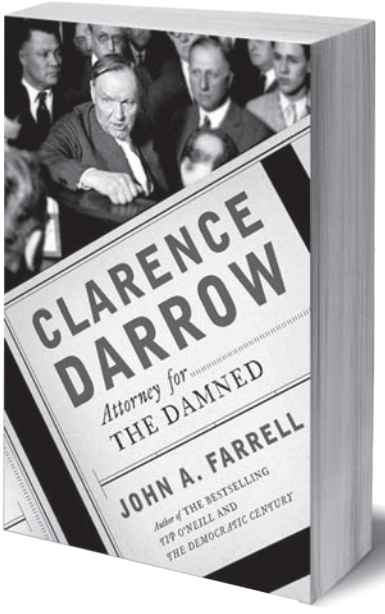
In a sad footnote, after this story was written but before it was first published, Harold 'Bull' Alexander, the man who dismissed Bradman and so impressed the impressionable young Keith Miller, died on April 15, 1993. He was 87. ■

Note: This article was first published in the Skeptic 13:2 in May 1993. In 2001 it was selected to be published in The Best Ever Australian Sports Writing: a 200 Year Collection*, edited by David John Headon and published by Black Ink, Melbourne. (And, as Barry says,* "If you think I don't skite about that, then you do not know your former editor."*)*

About the author: **Williams, BJ,** former president, executive officer and editor for Australian Skeptics, was given a lifetime achievement award in 2011. The prize, appropriately, came with a replica of the Ashes urn.

The Lawyer's summation

Clarence Darrow: Attorney for the Damned
By John Farrell
Scribe Books, **A$39.95**



To readers of this magazine, Clarence Darrow is probably best known as defence attorney for John Scopes in the infamous 'Monkey Trial' in 1925. However, his career was significant not just for this case, but also for his activities defending labour-related court matters and capital crimes throughout the US. He dealt with cases that were considered unwinnable, thus gaining the reputation of being the "Attorney for the Damned".

This book was listed by the *New York Times* as one of the 100 most notable of 2011, and Farrell, a former investigative journalist for the *Boston Globe* and the *Denver Post*, has won a number of awards for previous books written as a White House correspondent.

Clarence Darrow has been portrayed many times in movies, plays and books, but this volume takes a different route, dealing with Darrow from a personal perspective using material from archives, some of which have not previously been released.

Darrow was born in 1857, the child of freethinkers - his father Amirus Darrow was known as the 'village infidel' while his mother was a defender of woman's suffrage and female rights. After graduating from law school, he made his mark in the labour movement and as a campaigner against the death penalty. He defended more than 50 criminals on murder charges and only lost one - his first murder trial - to the death penalty. Farrell discusses many of these cases, and especially Darrow's oratory skills in closing arguments, which sometimes lasted for days. It was these speeches that today captivate many in the legal profession as some of the best ever given in a court room.

This is the author's strength, his ability to describe conversation and speech in the court. But this style also lets him down in regard to analysis of the trials. Farrell is a journalist, and his writing tends to leave a gap regarding the effects of Darrow's actions at major criminal matters and the Scopes Trial. Farrell jumps from one event to the next in a biographical manner, but fails to really address the implications of the trials, thus missing the opportunity for the reader to fully appreciate the ramifications of Darrow's actions, speeches and writing.

The 1925 Scopes Monkey Trial in Tennessee, was perhaps the greatest of Darrow's career. Farrell again shows all aspects of the trial from the inception of the offence, the politics, the people and the trial itself. He illustrates the trial well, how it was moved outside of the court house onto a grassy area in front of the court, the reporters arriving from across America, the interviews and the overall circus that the trial ended up being. He provides an interesting account of the circumstances surrounding the teaching of evolution by Scopes as a result of a barbershop discussion, and the book provides a valuable essay on the context of the trial as a result of Christian extremism and the war against Darwinism.

The introduction of the 'Butler Bill' in Tennessee in 1925 made it illegal to teach Darwinian evolution in schools or, for that matter, any other theory that denies the story of the Divine Creation. Hence, science was being put out the door and replaced with creationism, supported by state law.

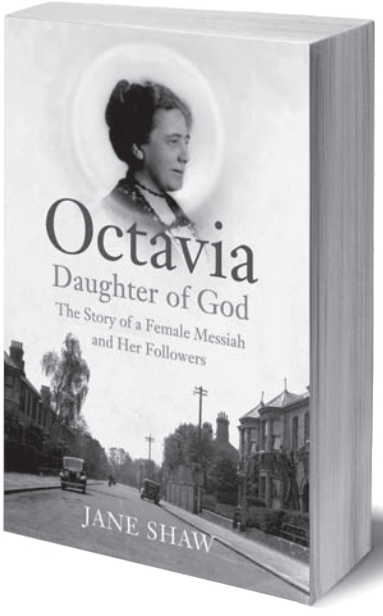
Darrow lost the trial and Scopes was fined $100 for teaching evolution in a school, though that judgement was later reversed on a technicality.

Farrell does cover many of Darrow's failings and ultimately his end. He lost all his money in the Depression and after his death in 1938, Darrow's wife Ruby was forced to sell their apartment, library and many possessions to pay for the funeral and prepare for retirement. The books that Darrow used at the Scopes trial were sold for several hundred dollars; the knife used by Darrow to sharpen his pencils while defending inmates from the death penalty sold for $1.50. Even the scattering of Darrow's ashes is described in sad detail: a lawyer sitting in the car because it was raining while Darrow's ashes were scattered, like a person discarding a piece of rubbish, off a stone bridge. It was, in my opinion, a sad and defining moment. Regardless of all the good Darrow had achieved in his life, the ending was so contrasting with his outstanding life. This is what many books on Darrow fail to achieve, but Farrell does.

- Reviewed by Geoff Cowan

Praise God & Pass the Cherries

Octavia, Daughter of God: The Story of a Female Messiah and Her Followers
By Jane Shaw
Yale University Press, **A$45.00**



In 1919, a group of middle-class English women in Bedford, devoted to English ways and to the Church of England, received a revelation that would change all their lives forever. One of their members, Mabel Barltrop, was the daughter of God.

The members started calling her Octavia. She was 53 years old, a widow of a priest in the Church of England, and she announced a new theology. There was God the Father, and Jesus the Son, and God the Mother, and Octavia the Daughter.

Her organisation, the Panacea Society, was to be bustling and moderately influential, and it was inescapably dotty. It was a cult, but author Jane Shaw has presented a sympathetic picture of a cult that was pleasant, silly, and unthreatening. It is refreshing to read of a cult so mild.

Shaw is a theologian herself, the Dean of Grace Cathedral in Washington, and she is sympathetic to the Panaceans, who could not have asked for a better-rounded portrayal of their organisation. Shaw has brought in over 400 pages of details to describe the society and its activities. The Panaceans were sincere, they were not charlatans, and their ideas (especially seen at this temporal remove) were often just batty. Shaw writes with understanding and humour, and although there is sometimes some archness in what is a truly funny story of eccentrics, she is never condescending.

Octavia had a difficult life, including a marriage shortened by the death of her husband (whom she years after the fact identified as Jesus). She was hospitalised as a melancholic twice, the second time for eighteen months. She may well have harnessed her compulsions into her obsessive management of her religious group's activities and personal behaviours, and she might well have felt that redeeming the world would be a good ease against depression.

She took her religious inspiration from the British prophetess Joanna Southcott, who had died in 1814 at a time when she had announced that she (at age 64) was pregnant with Shiloh, the messiah promised in Genesis. Shiloh, according to those who continued to believe in Southcott's prophecies, would come when the world was in deep crisis, and World War I fit the bill. Octavia was convinced that she herself was just that Shiloh, and she founded the Panacea Society in 1919. The new Jerusalem and the new Garden of Eden were to be centered in the market town of Bedford. It was a woman who had arranged for the expulsion of the original God-created pair from the original garden, and Octavia reasoned that a woman was needed to get everyone back to the pre-Fall paradise and bring on the Millennium.

It was not simple to be a member of the Panacea Society. Part of the fun in thinking about this cult is that they were devoted to bourgeois life. When Octavia imagined her community, she wrote to a friend, "Wouldn't a Hostel – a 'Land of Goshen' – be lovely? Really devoted 'believers' could take up nice houses in Bedford which is a most lovely place & is going up by leaps & bounds. Selfridges is coming [&] has taken a huge block in High Street." Selfridges is an upscale department store chain; Shaw jokes that Octavia "is the only Messiah figure in history to name Selfridges as a selling point to her followers."

Edwardian, if not Victorian, domesticity was the rule. One of Octavia's letters, pages of complex theology, ends with, "I am so sorry about your burst pipe and that you have a cold." She held such objects as a household broom to have particular meaning, thinking of herself as the broom to sweep the world of evil.

Octavia had a system of managing that was attentive to detail, or in other words, intrusive. No other religious society was so built on etiquette. Her paper on manners declares, "Any person who makes an undue noise when eating toast, and declares they cannot avoid it, must leave off eating toast and must not take any other food which causes them to make a noise." She gave written instructions on all matters theological, often mixing them with household management. Panaceans were to eat date pudding, for instance, on Palm Sunday, because dates grow on palms. No home economist paid more attention to telling others about minutiae. The women might for years have run their own households and baked their own cakes, but Octavia insisted, "If cherries are put in a home-made cake, it wants *a lot* of cherries, or add

cherries to a lot of other fruit with it; hardly ever are there enough cherries in a cherry cake."

There was one tiny detail in which the households of the members could not be typical of the British middleclass: Octavia recommended celibacy. There were about seventy resident members, and almost all were women. Many were widows like Octavia herself, and some were wives who found that Panacean spiritual life meant more to them than marital life. Some who remained married got their husbands to join, and presumably stayed celibate ever after. Despite her emphasis on female power, Octavia was no suffragette; the sort of liberty the suffragette movement encouraged, asserting independence even against the church, was not for her.

The theology of the church was all in preparation for the eminent arrival of Jesus, and the members intended to make him personally welcome. Indeed, though the Panacea Society is barely hanging on, they have Number 18 Albany Road reserved for Jesus, with new carpets and new curtains, and a shower. There are few members left, so most of the community's houses have been rented out; the current residents of the apartment assigned to Jesus are on two month's notice.

The Panaceans discovered they had the gift of healing. Octavia would breathe on tap water, which would be used to dampen linen, and the linen would be dried, cut into small squares, and mailed all over the world to cure anything. It worked, too; recipients were politely required to send regular reports on the results, and administrators at Bedford tallied them up and kept records on them. (The records reflect Octavia's obsessiveness; the rich trove of detailed records was made available to Shaw, who though she is not a member and does not share Panacean faith, is a trustee of the society as it remains.) Cards that had been imbued with the water might be used to redeem buildings. If you had money in a bank, for instance, you were to drop a card within the bank and that would somehow sanctify and protect it, and although it didn't matter if the card were swept up and discarded, you might put a little glue on beforehand and stick it under the counter. The ladies also chased around England sprinkling their water on establishments that needed it, like the Houses of Parliament, Buckingham Palace, and Westminster Abbey.

They were especially interested in a sealed box of prophecies from Joanna Southcott, a box that was to be opened in the presence of 24 Anglican bishops (and they have special rooms for the 24 ready for the opening ceremonies). They had posters on buses to say "Crime and banditry, distress and perplexity, will increase until the Bishops open Joanna Southcott's Box," and the box became so famous it was eventually joked about by Monty Python. It remains in the possession of the society, unopened.

Though greatly reduced in numbers now, the society struggles on. The greatest of its shocks must have been Octavia's own death; she was found dead in her bed one morning in 1934.

"The shock was not just that of discovering a dead body," writes Shaw. "It was the horror of discovering that the beloved divine daughter had actually died in a community that promised immortality." They did keep the body around for three days before burying it, in hopes that Octavia would arise.

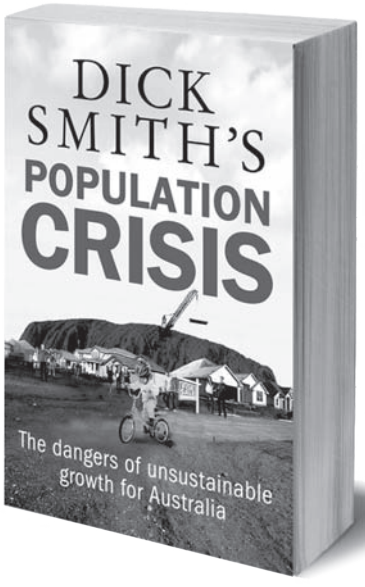
It all seems not to have been enough of a shock to hazard the strong faith her followers had in Panacean beliefs, but with the loss of Octavia's strong leadership, and with the emphasis on celibacy, and also with the general sweet silliness of the society's tenets, the numbers are dwindling and no new members are being sealed within. It was a cult with a limited run, and certainly there are those who are going to think that the enormous amount of attention Shaw has paid it in this history is a misplacement of effort about trivia. It is always interesting, however, to see the way strong faith may cause humans to behave in curious manners. The Panaceans at least caused no direct harm, and Shaw's history of their movement is funny and instructive.

- Reviewed by Rob Hardy

Below: Jesus' house in Bedford, should he ever want to visit

People are the Problem

Dick Smith's Population Crisis: The Dangers of Unsustainable Growth for Australia
By Dick Smith
Allen & Unwin, **A$20.00**



Few issues have been so ignored, by so many politicians, as the world's burgeoning human population. At the Climate Change Summit in Copenhagen, the problem driving it all - too many people - wasn't even on the agenda! Then, when our former PM Kevin Rudd announced his support for a 'Big Australia', it motivated businessman and entrepreneur Dick Smith to oppose what he sees as this "naïve belief". Dick credits his daughter Jenny for bringing the matter to his attention, describing it as "the elephant in the room which no one was discussing".

Like others before him who have raised this issue and its consequences for humanity, Dick also has been branded an alarmist by many critics. When Paul and Ann Ehrlich published their book *The Population Bomb*, in 1968, they were accused of taking the Malthusian catastrophe argument to extremes, predicting widespread famine, and that nothing could be done to prevent it! Fortunately, the population growth rate slowed due to the contraceptive pill (at least in the developed world). Also, new oil discoveries and Norman Borlaug's 'green revolution' for increased food production lessened the impact of increased demand.

For most of human history, the world's population grew relatively slowly, but after the Industrial Revolution the growth rate accelerated. Infant mortality has been reduced, and at the same time, people are living longer, due to modern medicine, improved public health measures and better nutrition. This year, the world's human population exceeded 7 billion (tripling during my lifetime), and is projected to reach 9 billion by mid-century. But as Dick points out, there are many examples in the past where human populations have expanded to the point of self-destruction. In Australia, every major study into our population carrying capacity has been effectively buried by politicians or bureaucrats driven by the myth of 'populate or perish'!

In one way or another, the population problem is also a product of our widespread use of fossil fuels, particularly coal and oil. But the world has now reached 'peak oil', and dwindling supplies could mean a bleak future for us all.

The author poses the question, "Even if we were to invent a miraculous new substitute for oil, how long would it be before we simply began expanding our population again?" And with his usual satirical wit, Dick suggests, "Perhaps the greatest energy efficiency technology of them all remains the humble condom".

Australia's outback remains sparsely populated, and for very good reasons, but the same cannot be said of our cities. Virtually all immigrants to Australia choose to settle close to our capital cities, whose growth rates now outpace those in Europe and North America. Of course, property developers welcome such growth, and many businessmen support a high level of immigration to obtain ready-made workers to fill jobs, which they claim Australians will not do, or for which there is a shortage of suitably qualified people.

Dick quotes agri-food experts who predict that by 2025, water scarcity could seriously limit the world's food supplies, condemning billions of people to chronic food shortages and increased prices. The aggregate price of food has already doubled over the past decade, and that trend looks certain to continue.

Critics have accused Dick of hypocrisy, double standards, lack of academic credentials, a Scrooge-like mentality, and obscuring the cause of ecological crises. Those who raise the issue of over-population are often accused of wanting to "eliminate surplus others - but of course, never themselves!" But Dick does not support compulsory euthanasia, or social engineering such as China's one-child policy. Rather, he advocates the sensible option of raising the education and literacy standards of people everywhere, particularly women in developing countries - and this would include family planning and contraception. While some of our politicians and captains of industry might yearn for a bigger Australia, the majority of people do not. As Dick points out, almost every social problem we have in our cities, from grid-locked roads to over-taxed infrastructure for public transport, health, education, electricity and water supply, is exacerbated by more and more people. Although Dick believes that Australia could support many more people, maybe even a hundred million, he asks, "Why would we want to?" Creating similar

overcrowded conditions here to those from which people have emigrated makes no sense.

I'm sure Dick would agree that many city people, particularly politicians, need to get out of their urban comfort zones and spend some time in our arid interior, where most of our grain, meat and wool is produced – preferably in summer, and during a drought. Otherwise, they will not understand why Dorothea Mackellar's 'Wide brown land' cannot sustain a large population with any decent standard of living - and continue to feed the rest of the world. But the people of the outback understand, and almost without exception, they agree with Dick.

All skeptics and politicians should read this book, and then hopefully they will understand why Australia's present population growth is unsustainable and needs to be reduced drastically.

- Reviewed by Bernie Doran

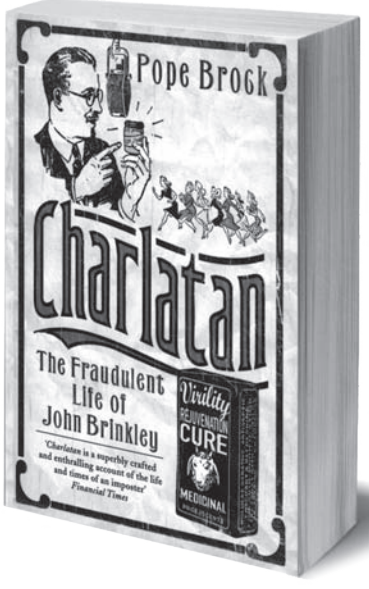
Editor's note: We hope to run an interview with Dick Smith in the next issue, in which he discusses his views on this issue, his own business past, his meetings with scared politicians and the role of the media.

'Doctor' on the run

Charlatan – The Fraudulent Life of John Brinkley
By Pope Brock
Orion Books, **A$21.00**

Why should a book on an astonishingly successful American quack 70 years ago be of any interest to an Australian skeptic? Reviews quoted on the book's cover refer to it being "a rollicking, funny, brilliantly readable book" and as a "very funny biography". So why should a skeptic feel the need to write a review about it?

In truth, I found this absolutely gripping and very relevant to contemporary Australia. The narrative contains many incidents that are certainly funny but only until the reader realises that the humour was at great cost to many. Australian skeptics have shown commendable leadership in the pursuit of quackery in quasi-medicine and pharmaceutics when politicians and too many professionals and health organisations have shown timidity in the face of resistance. The lesson from this book is that we must be as relentless in our pursuit of these characters as they will be in evading the full attention of the authorities.



John Brinkley made his fortune by preying on the fears, hopes and plain gullibility of thousands of patients and their families and by making effective use of the complex and inadequate American regulatory regimes regarding medical malpractice. Although many past patients swore by his treatments, it is undeniable that he caused great suffering and a great many deaths. He may not have been America's worst serial killer, but with a count of many dozens (at least) he is well up in the rankings. His 'career' stretched from assisting as a 22 year old junior 'doctor' (a white coat was his sole qualification) in Knoxville, Tennessee in 1907 to his death, as a multimillionaire, in San Antonio, Texas in 1942, not long after successfully escaping the last of a string of trials for malpractice.

Although he indulged in a range of quack treatments and remedies, Brinkley specialised in the insertion of goats' glands into humans to improve virility and to delay or even reverse the aging process. Even writing now it sounds unbelievable that it was so plausible. He was chased out of Chicago in the early 1920s and was then doggedly pursued by the medical establishment. Over the decades he treated thousands and moved between states and jurisdictions to circumvent his pursuers. He made imaginative use of the chaotic legal system, political contacts and local parochialism to evade each barrier placed in his way, including funding a powerful radio station across the border in Mexico that became a starting point of many a career for successful country and western stars.

At no time did he, or his closely-involved wife Minnie, ever complete any recognised medical certificate or training and it is clear from their actions and mode of operation that at all times they knew that the treatments were ineffective – they were classic charlatans out to exploit the poor, the ignorant, the vulnerable and the foolish.

This fine book is a warning and a motivation to maintain our campaign against those who knowingly and mischievously trade on the gullibility and ignorance of others – to their cost in both health and wealth.

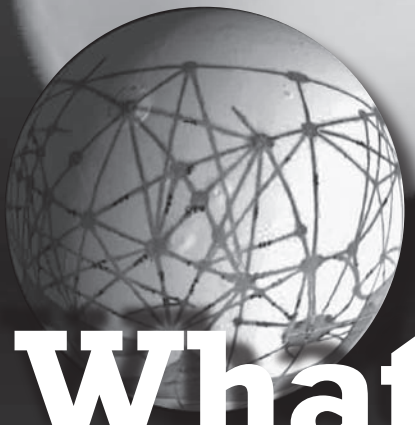
- Reviewed by Ian Foster

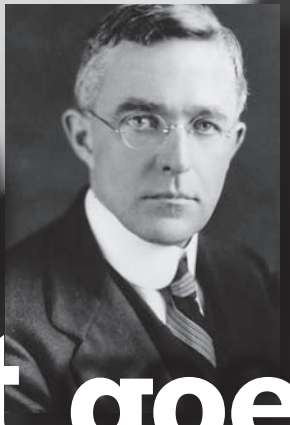
The cycle of life

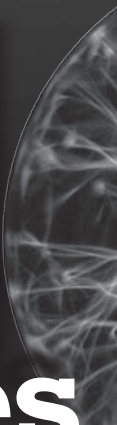
Pathological science – atomic science – nuclear science. So it goes, the almost inevitable realisation that all knowledge is connected and connectable.

NON SCIENCE

Pathological science is the process by which "people are tricked into false results ... by subjective effects, wishful thinking or threshold interactions". The term was first used by Irving Langmuir, Nobel Prize-winning chemist in a presentation given in 1953 with that title. Langmuir said a pathological science is an area of research that simply will not "go away", long after it was given up on as false by the majority of scientists in the field. He called pathological science "the science of things that aren't so". While some have rejected the term as covering things that are not 'pathological', examples of those areas described as pathological science include Martian 'canals', N-rays, polywater and water memory.







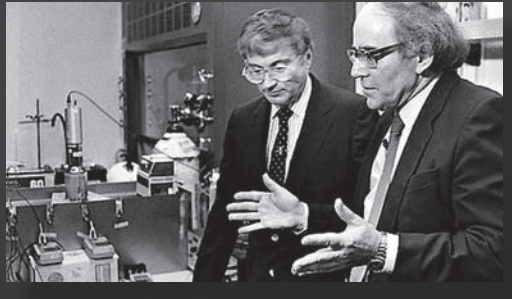
What goes

SCIENCE GONE COLD

Cold fusion, also called low-energy nuclear reactions (LENR), is described as a type of relatively low temperature nuclear reaction reported to have occurred by some experimenters, but which others have not been able to reproduce. Both the experimental results and the hypothesis are disputed, and hopes that had arisen after Fleischmann and Pons' announcement fell with the number of negative replications, the withdrawal of positive replications, the discovery of flaws and sources of experimental error in the original experiment. Most now consider cold fusion claims dead, though some continue to research the field. Following the failure to replicate Fleischmann and Pons' results, cold fusion gained a reputation as a pathological science.

FUSION SCIENCE

Bobby Stanley Pons (born 1943) is an American-French electrochemist. In 1989, while Pons was the chairman of the chemistry department at the University of Utah, he and Martin Fleischmann (born 1927), a leading electrochemist from Britain, announced the experimental production of 'N-Fusion', a sustained nuclear fusion reaction which was quickly labelled by the press as "cold fusion". They claimed that their apparatus had produced anomalous heat ("excess heat"), of a magnitude they asserted would defy explanation except in terms of nuclear processes. After a period at a French laboratory, Fleischman returned to England and Pons gave up his US citizenship and became a French citizen.

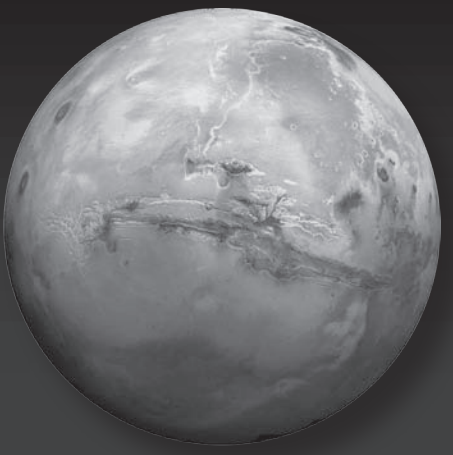


Pons and Fleischmann illustrate how big the impact of N-fusion will be.

around ...

WEIRD SCIENCE

Langmuir said that pathological science is a psychological process in which a scientist, originally conforming to the scientific method, unconsciously veers from that method, and begins a pathological process of wishful data interpretation. Some characteristics of pathological science are: claims of great accuracy; fantastic theories contrary to experience; criticisms met by ad hoc excuses; the ratio of supporters to critics rises and then falls gradually to oblivion; the maximum effect that is observed is produced by a causative agent of barely detectable intensity, and the magnitude of the effect is substantially independent of the intensity of the cause. Langmuir never intended the term to be rigorously defined; it was simply the title of his talk on some examples of "weird science".



The Red Planet, whose observable "canali" are channels, not canals.

ATOMIC SCIENCE

Irving Langmuir (1881-1957) was an American chemist and physicist. His most noted publication was his 1919 article "The Arrangement of Electrons in Atoms and Molecules" in which he outlined his "concentric theory of atomic structure". While at General Electric, from 1909–1950, Langmuir advanced several basic fields of physics and chemistry, invented the gas-filled incandescent lamp, the hydrogen welding technique, and was awarded the 1932 Nobel Prize in Chemistry for his work in surface chemistry. He was the first industrial chemist to become a Nobel laureate. The Langmuir Laboratory for Atmospheric Research in New Mexico was named in his honour, as was the American Chemical Society's journal for Surface Science.

UTAH SCIENCE

A Langmuir probe is a device named after Irving Langmuir, used to determine the electron temperature, electron density, and electric potential of a plasma. It works by inserting one or more electrodes into the plasma, with a constant or time-varying electric potential between the electrodes or between them and the surrounding vessel. An active centre of the study of Langmuir probes is the University of Utah, whose alumni include the founders or co-founders of Silicon Graphics, Netscape, Adobe Systems, WordPerfect, Atari, and Pixar. Notable faculty members include Venkatraman Ramakrishnan (Nobel Prize in Chemistry), Mario Capecchi, (co-winner Nobel Prize in Physiology or Medicine), and Stanley Pons.

The University of Utah, nestled in the mountains, and generator of science.

Source: Wikipedia

Health & healthy funds

In which are discussed insurance, spending, profits, and name changes

I wish to make some comments about your article "Money for Nothing" in the Alternative Medicine section in *The Skeptic* Vol 31 No 4, December 2011. I am an orthopaedic surgeon who has been practising in both the public and private systems continually since 1984. In addition I was on the Board of Directors of MBF before it was purchased by BUPA. I believe I have a good understanding of the entire system.

In the article you correctly observe that of the $12.4 billion in benefits [paid out], the taxpayer supports this to the extent of $4.5 billion. Despite the large numbers, the total benefits are still less than 10 per cent of the entire health costs in Australia. It has actually helped the public system but will never solve all problems. One only has to look at the increasing percentage of elective surgery being performed out of the public system to realise that there is some relief. The majority of joint replacements are now done in the private system in Australia. Also, all public hospitals actively encourage patients to use their health fund, which assists the hospitals in meeting budgets. As it is only 10 per cent, health funds can never be anything other than a help. The former Treasurer Peter Costello stated that he believed that it was a good investment of $12.5 billion health care for a government outlay of only $4.5 billion.

Firstly, private health insurance is not really insurance in the real sense. Most insurance is for crises or catastrophes. The effect is that insurance is only rarely claimed against. On the other hand, medical insurance is more about medical savings with an expectation that it is claimed against on a regular base. In fact most health funds pay benefits in the 85 per cent range with costs of 7-9 per cent and overheads of 2-3 per cent. What health insurance gives members is flexibility and predictability. I have always found it interesting that people will decide to go to a system where they are looked after by the system rather than the predictability of a designated specialist because it saves them some money. Most of these same people will spend more time considering what restaurant they would eat at and spend more money at such an establishment rather than knowing who was going to operate on them. Life is full of mysteries.

However, coming back to your article, I wish to take you to task about the suggestion that all money to health funds is somehow spent on alternative therapies. I am aware this is not said but there is an implication that a large percentage is spent that way. Health insurance is in two broad areas, hospital cover and extras cover. The majority of the money is to hospital cover. Within extras cover there are often different levels. The majority of extras cover is for dental, physiotherapy, high cost pharmacy drugs and spectacles, all very much mainstream. The very small amount left over does go to what the remains of your article is about and I would agree that this is an issue. The regulator is in their response being very typical. They do actually get involved in making rulings and some years ago MBF was forced into accepting some of these alternative treatments in response to complaints from some members.

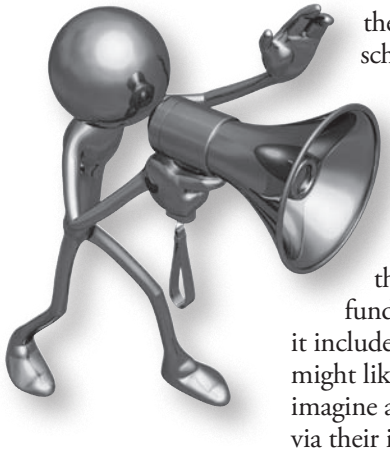
Personally I agree with the sentiments about the lack of science etc with these therapies. Some therapies funded by one fund that regularly advertises had me going to a dictionary to see what they were even talking about. The problem faced, however, is that these treatments are for many funds an extra part of extra cover. To stop the federal rebate for these would put the other mainstream parts of extra cover - dental, optical etc - at some risk. In addition, health insurance is a form of medical savings and these alternative therapies are separately costed. No one who pays these additional extra covers actually profits as the payments are much less than the claims. These additional covers are often the most profitable for the funds.

I believe that we need to continue to push for accreditation and a scientific underpinning of what we provide as health care and hopefully we can improve the system. However, when I see how little people actually consider how and where they receive health care, I do not believe that we will see any overall sanity in our lifetimes.

Brett Courtenay
Darlinghurst NSW

... and furthermore

For your information, the following is a copy of an email correspondence I have recently had with the NSW Teachers Health Fund regarding their inclusion of 'alternative' therapies in their Extras cover. I urged them, of course, to remove



these unproven therapies from their schedule, not really expecting them to have the courage to do so. So I suggested they should at least offer non-evidence-based therapies as a choice (with extra premiums, of course). This also appears to be too hard for them.

I am sending this to you in the hope that others may like to check their medical fund's schedule of extras and, if they find that it includes non-evidence-based therapies, they might like to lobby for their exclusion also. I can't imagine any rational person wishing to support, via their insurance premiums, the encouragement of people to indulge in the demonstrable nonsense - and danger - of alternative medicine.

Kevin Murray
Warriwood NSW

TO: Teachers Health Fund
FROM: Kevin Murray
DATE: 9/02/2012

Please forward this email to whoever is in a position to influence Teachers Health Insurance policy.

I have been a member of Teachers Health for more than 35 years (member number 76XXXXX), over which time I have paid tens of thousands of dollars in premiums. But I have only recently been made aware that my health fund pays out for a number of 'treatments' that have no scientific evidence showing that they work any better than placebos. These 'treatments' are usually collated under the umbrella of "Alternative Therapies", and are to be found in your Extras Cover list. They include chiropractic, osteopathy, acupuncture and natural therapies (whatever they are!). At least you haven't got homeopathy on your list!

I most strongly object to my premiums being used to pay for these 'treatments' when even a passing acquaintance with the scientific/medical literature shows that the vast majority of them perform no better than placebos when subjected to properly designed randomised, double-blind trials that form the standard for medical testing today. In fact, with the exception of a few herbal substances, such as Echinacea, they can all be viewed merely as nothing more than very expensive placebos ... at best being a waste of money, at worst encouraging people not to seek medical treatments which are actually proven to work.

Rather than reproduce here the compelling evidence for the above statements, I would direct you to just one book where the case against these therapies is very clearly made: Trick or Treatment by Simon Singh and Edzard Ernst. It leaves the intelligent reader in no doubt about the inadequacy, and even danger, of such treatments. If, after being made aware of the lack of real evidence for the usefulness of these therapies, you still wish to include them on your Extras list, then I would really appreciate an explanation as to why part of my expensive premiums are being diverted to fund this demonstrable nonsense.

Most people are unaware of the weight of evidence against the efficacy of these alternative therapies, sucked in by the clever marketing and downright mistruths perpetrated by those who make bucketloads of money from what amounts to little more than bogus snake-oil cures. However, I feel strongly that those of us with confidence in evidence-based medicine should not have to fund those who are either ignorant of the evidence, or unwilling to understand or accept it. In other words, if someone wishes to waste their money on alternative medicine then so be it. I just don't want them wasting my money; medicine is expensive enough without my premiums supplementing the ignorance of others. If you really want to insure people who choose to access these therapies, then I suggest you remove those therapies from the Extras list that we all contribute to, and place them in their own category for which people pay extra and which I, as a scientifically literate member, can choose not to join or fund.

I would appreciate a response to this email with an explanation as to why you have chosen to include these therapies, and with a suggestion on how you might consider someone opting out of them (with a reduced premium, of course) or opting into them (by paying extra).

Thanking you,
Kevin Murray

PS: Remember that "alternative medicine" with evidence that it actually works is called ... "medicine".

. . . . . .

TO: Kevin Murray
FROM: Teachers Health Fund
DATE: 10/02/2012

Thank you for your email.

Our products are designed to be competitive within the Health Insurance Market, and provide a range of cover which suits our members' needs. This does not necessarily mean it suits all our members' needs, as we are unable to provide specific products for each individual person. We have provided cover for a range of products which our members wish to claim. We continue to include these treatments in our products as much of our membership base benefit from these treatments

and wish to continue using those services. If you are unhappy with your level of cover, we provide a range of different options. These options can be found at www.teachershealth.com.au. Alternatively we can provide you with a brochure. You have the option of removing your ancillary cover all together, and continuing on with your hospital cover. Or reducing your level of cover to Essential Extras. Please note that all our ancillary options include cover for Natural Therapies and we are unable to provide you a level of ancillary cover which does not include these additional benefits.

Should you have any further questions, please do not hesitate to contact us at 1800 728 188 or via email at info@teachershealth.com.au

Kind Regards
Mary Smith [name changed]

. . . . . .

TO: Teachers Health Fund
FROM: Kevin Murray
DATE: 10/02/2012

Thank you, Mary, for your prompt reply.

You state, and I quote, "We continue to include these treatments in our products as much of our membership base benefit from these treatments and wish to continue using those services". My contention is that you are a health fund, so should be insuring only for those products that are proven to benefit the health of your members. It has been proven numerous times through comprehensive controlled, randomised, double-blind tests that chiropractic, acupuncture and other 'alternative' therapies most definitely do not benefit the health of patients, beyond their placebo effect. I am happy to supply the references to the scientific literature that provides this definitive proof. This is not a matter of an individual's opinion. It is a matter of demonstrable fact.

Given that this is the case, I continue to question why you are funding these alternative therapies at all, since they clearly do not contribute to the health of your members. They merely end up costing all of your members more money in higher premiums. But given that you appear to be responding to perceived 'market needs' rather than your members' real health needs, and therefore wish to continue insuring these alternative therapies, I strongly suggest you reconsider their inclusion by default in your Extras Cover. Surely it would not be too difficult to separate your Extras Cover into "evidence-based" procedures and "alternative" procedures (ie, those lacking evidence), with an option to choose between them (or to choose both)? That way those of us (and there are many more than just me!) who wish to use medical procedures based on real evidence of their efficacy can be satisfied that we are not supplementing the costs of unproven, expensive placebos.

I look forward to your response.

Kevin Murray

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TO: Kevin Murray
FROM: Teachers Health Fund
DATE: 15/02/2012

Dear Kevin,

Thank you for your recent correspondence regarding our coverage of Alternative Therapies.

I refer to the positioning statement on Alternative Therapies from Chief Executive Officer, Brad Joyce, as published in the Spring edition of Teachers Health Fund's member magazine, Healthmatters:

"Teachers Health Fund firmly believes in providing information, products and services that are in the best interest of the majority of members. All members are entitled to their personal opinions in relation to the efficacy of alternative therapies and while some may be sceptical, others advise they receive significant and long lasting benefits from these services. Our coverage of Alternative Therapies reflects our commitment to providing members with choice and flexibility in the treatment of health related illness or injury.

"It is for this reason that we, along with all other Australian health insurers (with the exception of the Doctor's Health Fund) provide coverage for Alternative Therapies.

"Alternative Therapy practitioners must be registered with an appropriate Professional Membership Association and endorsed by their Board, in order for Teachers Health Fund to recognise them as a provider of such services. This means that the practitioner must be qualified in their therapy, hold a requisite level of professional indemnity insurance and hold a current First Aid Certificate. Teachers Health Fund conducts a review of Recognised Providers annually, and de-registers non-complying practitioners accordingly.

"We acknowledge that the term 'alternative' may be a misleading description for such services. Accordingly, we have renamed them 'Complementary Therapies'. This change is now reflected on our brochure and on our website."

I appreciate the time taken to send us your feedback regarding this issue. I hope that this response serves to allay your concerns.

Yours sincerely,
Tom Wilson [name changed]
Team Leader - Member Relations

What you think …

Climate Change

In the last edition of *The Skeptic* (December 11) I suggested that Ian Bryce's three-legged stool test, if applied to the Intergovernmental Panel on Climate Change's (IPCC) claim of catastrophic anthropogenic global warming, would demonstrate how such a claim fails each of the 3 tests. Ian responded by saying I was mistaken on every point.

If any reader still regards the IPCC as the "Gold Standard" of climate science, I recommend they read Donna Laframboise's expose of the IPCC in her book: "The Delinquent Teenager Who was Mistaken for the World's Top Climate Expert." I'm left wondering if Ian actually read this book since he appears to simply dismiss the large body of evidence Laframboise provides in exposing the IPCC as a political/ideological organisation masquerading as an impartial scientific body.

I would also ask readers to look at my open letter to Australia's Chief Scientist, Professor Ian Chubb. This can be found at www.scienceheresy.com (click on: The Chief Scientist's Call to Arms).

In this letter I provided statements from many scientists who actually contributed to the IPCC process in good faith and strongly criticised the IPCC process. I also provided many examples of IPCC scientific malfeasance. I ask readers to decide if, as Ian implies, I am "inventing misdeeds and misinterpreting frank chit-chat."

Any individual who is familiar with the climate science literature and then reads the IPCC scientific reports, along with the Summaries for Policymakers, will immediately become suspicious about the IPCC process. Any individual who is familiar with the climate science literature and then reads both sets of emails leaked from the University of East Anglia will have those suspicions confirmed.

The IPCC and its acolytes are now being implicated in what will surely prove to be the biggest scandal in the history of science and Ian appears to have no idea what is happening.

John Happs
Sorrento WA

Skepticism is about finding and evaluating the evidence, not creating your own facts.

In *the Skeptic*, 31:4, p60, Mark Lawson says: "the ongoing grumbling about the scientific orthodoxy is not driven by crankiness, or a conspiracy, but by the simple observation that measured temperatures do not seem to be paying much attention to the theory".

Crankiness is the charitable explanation for persistently repeating debunked canards, like:
"that global temperatures have not gone anywhere much since 1998."
In the same issue, p59, Geoff Sherrington chips in: "estimates of global temperatures are unchanged since about 1996, to a high degree of significance. This is especially the case of temperatures measured by satellites since 1978".

And John Happs (p52) says: "the atmosphere and oceans stubbornly refuse to warm".

What does the observational data actually show?

A graphing tool using the most widely used data sets shows a positive temperature trend for 1998-2008, or from 1996-, or the satellite series from 1978.[1] The oceans continue to warm.[2] The minimum period of time to determine a statistically significant temperature trend is actually 17 years.[3] The trend remains positive unless you deliberately choose a flat or downsloping bit.

The current decade is warmer than the one before, which is warmer than the one before that, etc. Something is going on. Human activity has something to do with it - natural factors aren't enough to explain the modern temperature record.

Back to Mark Lawson: The Kaufmann, et al. paper[4] doesn't say what you say it does. It doesn't agree with Carter at all - and they say this in the first paragraph of the first page of the paper: "prompts some popular commentators[2,3] to doubt the existing understanding of the relationship among radiative forcing, internal variability, and global surface temperature".

Reference 2 is to one of Carter's missives in the *Courier Mail* which is at least consistent with his ongoing media campaign.

Kaufmann concludes: "The results of this analysis indicate that observed temperature after 1998 is consistent with the current understanding of the relationship among global temperature, internal variability and radiative forcing, which includes anthropogenic factors that have well known warming and cooling effects."

This is inconsistent with the positions of Carter and Lindzen.

The level of climate sensitivity they argue for is inconsistent with observational and paleoclimate data. We couldn't have had ice ages or interglacials with Lindzen's value for sensitivity.

Back to John Happs: Laframboise's polemic makes a few glaring errors.

The IPCC reviews the literature. There is no "deliberately selecting literature which supports its alarmist catastrophic global warming view".

Laframboise is apparently ignorant of how postgraduate research actually works. Stating that graduate students wrote large portions of the reports was wrong. The people that she named actually made minor contributions as part of working towards higher degrees.[5]

The 'citizen's audit' of WG1 that she led is comparable to the 'Climategate' email quote-mining exercise.

Laframboise on climate science

Climate

is about as reliable as S.F. Singer on the risks of smoking (climate science, ozone depletion, etc) or Meryl Dorey on immunisation.

Completely ignoring the IPCC, the balance of evidence in the scientific literature is probably more 'alarmist' than was conveyed in the 4th Assessment Report.

A few examples: The Arctic ice is shrinking faster than projected.[6] The Bering Sea is acidifying faster than projected.[7] High levels of climate sensitivity have not been excluded.[8]

Question the claims, seek the evidence.

Robert O'Connor
Gorokan NSW

REFERENCES

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2. http://www.argo.ucsd.edu/global_change_analysis.html#temp
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[Editor's note: a letter from Mr O'Connor in the last issue of The Skeptic (31:4, p58) was incorrectly attributed to Bill Smalley. Our apologies to Mr O'Connor; Mr Smalley, on the other hand, seems to be pleased with his eloquence – see his letter elsewhere this issue.]

In the December 2011 edition of *The Skeptic* (pp 52-53), John Happs provides a rather lengthy book review of a publication by Donna Laframboise, whom Dr Happs describes as an investigative journalist though she is actually qualified in women's studies (https://profiles.google.com/116698682371698041493/about). That is an admirable field, but it is hardly one I would choose to assess the validity of climate (or any) science.

Dr Happs claims "the atmosphere and oceans stubbornly refuse to warm", but this is clearly a false statement, as shown by the graph reproduced on page 54 of the same issue. Lest people suspect that this graph is derived from faulty or mendacious data (as Dr Happs seems to be implying) it is worth noting that the Berkeley Earth Surface Temperature study conducted an independent, skeptical analysis of temperature data. Their findings match almost exactly the findings of the world's climate scientists (http://www.sciencedaily.com/releases/2011/10/111021144716.htm).

Rather than waste time with a voluminous discussion of every point (made more difficult by the lack of referencing to the various assertions made) I simply direct your readers to the Skeptical Science website where, unlike some of the heated debate on global warming, denialist claims are presented with a full discussion as well as links to the actual scientific papers so that the veracity of each can be assessed in the light of evidence and not polemic: http://www.skepticalscience.com/argument.php.

Robert Mapson
Camillo WA

Mass & Other Matters

A letter appears above my name (*The Skeptic*, 31:4, p58) which is either an astounding piece of automatic writing which I have no recollection of doing or is wrongly attributed. The latter seems more likely and anyway, it is far too erudite to have come from my pen.

On Wayne Robinson's response (p57) to my previous letter, an article by Lev Okun in *Physics Today*, June 1989 states categorically that mass does not vary with velocity and goes on to discuss the confusion which has arisen over the years. It might be that Wayne is confusing mass with weight, which does vary with the local gravitational field strength. Such a confusion would explain much of what Wayne has to say on the topic.

My thanks to Ian Bryce for explaining the (legitimate) dodge in letting G have a value of 1.

On the Forum piece "Science and non-science" (p52), John Happs' arguments appear to comprise a questioning of motives and 'agenda', without showing where the IPPC's findings are wrong. I've no idea whether they are right or not, but *ad hominem* attacks and the imputing of dodgy motives do not make a case. It's necessary to show where the science is not supported by the evidence. There seems to be some confirmation bias in there too, in that John has a side-swipe at the 'non-scientist' chairman but accepts the sayings of the non-scientist journalist. I wait with interest to see what John makes of the graphs presented by Ian Bryce on p54.

Bill Smalley
Maylands WA

[Editor's note: Re Mr Smalley's attribution of another's letter in the last issue, see the editor's note at the end of the letter in this issue by the unfortunately uncredited Robert O'Connor.]

Junk News

I had no particular argument with the article by Julian Cribb decrying much of the content of newspapers ("Junk Age", *The Skeptic*, 31:4, p34), but I will comment on one point. He says that there used to be a rule that journalists had to confirm a fact from two sources before writing it, and that rule seems to have been forgotten.

I have been in newsrooms for more than 30 years now and I know there was never any such general rule. American journalists do cite such a rule for investigative pieces but it hardly applies to press releases, news conferences or company announcements, particularly if the journalist is hard pressed, which is often the case now.

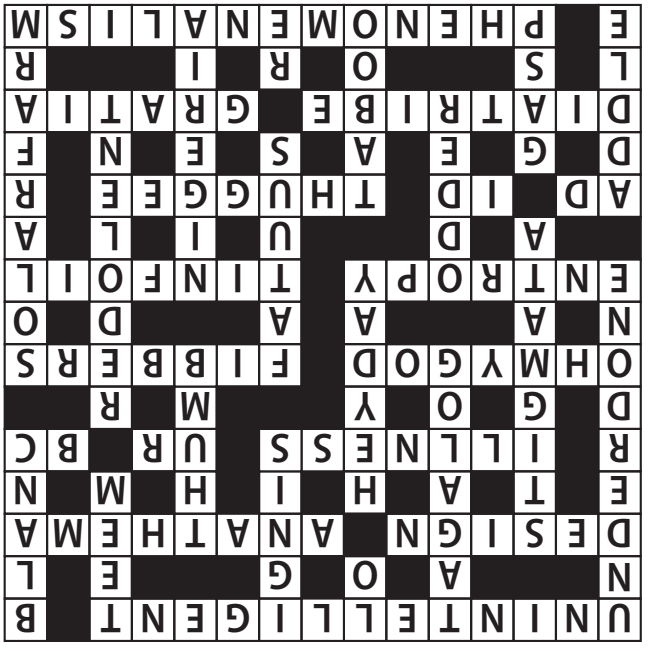
The two-source rule is, very likely, a form of self-regulation peculiar to American conditions. If an Australian journalist happens to be doing some sort of investigation (I have done a little of it in my time) the emphasis is not so much on confirming a particular point but in working out how to defend a story which you know to be true from the subsequent defamation action. What evidence can you actually present to a court? What can be written about the issue without ending up in a world of legal hurt? Confirmation from sources that remain anonymous would be useless in defending any defamation action here, but the law in America is quite different. So the two-source rule there seems to be a self-imposed way of preventing journalists there from bursting into print with gossip. Whether it works properly is another question.

As for general content of newspapers, their strength has never been in balanced, informed commentary – at least not the mainstream publications. But there have been changes of late because those publications have lost their monopoly on news presentation, along with their classified advertising, to the internet. In an effort to keep readers, newspaper content has generally shifted away from the so-called hard news (politics mostly), toward lifestyle type stories, mixed with alarmism about various issues.

I have no idea what can be done about this, if anything at all. Part of the problem is that the general public say they want balanced, informative stories but are not willing to pay for these stories and don't recognise them when they see them. If Julian can suggest some solution to this problem I'd be happy to hear it – a lot of journalists would.

Mark Lawson
Hornsby Heights, NSW

CRYPTIC CROSSWORD SOLUTION



DR BOB'S QUIZ SOLUTIONS

1. **Only 6%. Most of the criminal acts, notably dangerous driving, are committed by Noddy himself.**

2. **Because fish don't have any legs ... but seriously, it was because Ch'in had died and this fact had to be kept secret, but his dead body was a bit on the nose.**

3. **Carefully planned beforehand by Jesus and J.Iscariot, at whose house it was probably held.**

4. **Yes, and how beautiful.**

You can see more like this, every month and going back some years, at www.skeptics.com.au/features/dr-bobs-quiz/

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Great Ocean Road Skeptics – *(Geelong)*
Meets on the last Wednesday of each month from 6pm, City Quarter, Cunningham Pier East Geelong
Contact: Carolyn Coulson carolco@barwonhealth.org.au

Melbourne Eastern Hills Skeptics in the Pub
Meets second Monday of each month at The Knox Club, Wantirna South.
Contact: Lucas Randall 0423141453
mehsitp@codenix.org
http://mehsitp.codenix.org

Melbourne Skeptics in the Pub
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http://www.melbourneskeptics.com.au/skeptics-in-the-pub/

Mordi Skeptics in The Pub
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Peninsula Skeptics – *(aka The Celestial Teapot)*
Contacts: Graeme Hanigan 0438 359 600 or Tina Hunt 0416 156 945 or glannagalt@fastmail.fm
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