

In their early years children are knowledge junkies, questioning everything in their view, though exhibiting little skepticism. Most never learn to distinguish between inquisitiveness and credulity. Those who do either come to a bad end or become professional skeptics.

Michael Shermer

Skeptical newspaper column

Mysticism in a labcoat?

Jeanette Wilson's spiritual healing

Homeopathic overdose

Skeptic

new zealand

number 95 – autumn 2010

www.skeptics.org.nz

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ISSN - 1172-062X

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Deadline for next issue:

June 10 2010

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

Material supplied by email or CD is appreciated.

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Subscription details are available from www.skeptics.org.nz or PO Box 29-492, Christchurch.

A tribal occasion

WHEN Richard Dawkins made a flying visit to New Zealand in March he attracted people from all over the country – including three from this household. Tickets to all events were quickly snapped up, but fortunately friends in the Auckland University Alumni Association put some aside for us.

The information content of a one-hour lecture (with about 20 minutes for questions) is not that great. And there wasn't much in his presentation that anyone familiar with his work wouldn't have encountered before, although he concluded with some ideas on the origins of religion that were new to me. For not much more than the \$30 admission fee (less than half what Kelvin Cruickshank charges for an evening, I had to note) you could buy one of his many books, which would keep you busy for days.

But the evening wasn't really about learning new stuff. It was a gathering of the tribe, of sorts, though admittedly it's a rather odd tribe. It's one that doesn't really have leaders, but to paraphrase Terry Pratchett, Richard Dawkins is one of the most highly regarded of the leaders we don't have. It was just good for one's cosmic energy levels, to be in the same room, and breathe the same air for a while.

One gratifying feature of the evening was the age range in attendance. Grey, balding heads and beards would once have overwhelmingly predominated at an event like this, but there were good numbers of university age in the audience, and a much more even gender ratio than would have prevailed 20 years ago. Our 19-year-old daughter received jealous comments when she had to graciously decline an invitation to a steampunk party the same night.

And as a bonus, we picked up several free copies of *The Origin of Species* – the edition with the "Special Introduction" by New Zealand-born creationist Ray Comfort, which were being handed out on the street nearby. He's gone out of his way to make Darwin's words inaccessible: I didn't know they made typefaces that small, although of course his introduction is impeccably laid out, with lots of amusing 19th century caricatures of Darwin. But I can't help thinking that distributing this book to people who otherwise would never go near a copy is not a brilliant strategy, especially now he's been made to call in his original version that was missing crucial chapters. Poor old Ray was never the sharpest knife in the drawer – check out his clip on YouTube about how the banana is an atheist's worst nightmare. This latest stunt of his will no doubt create further amusement, but few converts, unless they're in an unintended direction.



Clones in space: Responses to the Dominion Post science column

Bob Brockie

At last year's NZ Skeptics conference Bob Brockie reflected on his career as a newspaper columnist and explained why he has no future with the Mormon Church.

AFTER spending most of my life as a scientist, at the age of 69 I became a weekly science columnist for the Dominion Post and Evening Post. I've written about 500 articles now and people ask where I get my stuff from. Mostly I get it from trawling through weekly scientific magazines, from the other side of the world. I like to bring the curious or obscure, gee-whiz stories to public attention.

The media is overrun by stories on climate change, pollution and conservation. I write about anything but those subjects. That's not news to me; I report other things.

Alien DNA

In 2003 I wrote about an amazing group of people called the Raelians and their claim to have cloned a little girl called Eve. Rael is a French former sports-car journalist who claims he was abducted by little aliens, who told him that 40,000 years ago they came to Earth and produced these little Eve-like creatures. At any moment, the

Raelians say, they will present their DNA to the scientific community.

I didn't get any response from this article from local people, but I did get an invitation from the Australian chapter of the Raelians to attend their next gathering three hours north of Sydney, where a white robe would await me.



Bob Brockie: The Dominion Post's regular science columnist since 2001 has received floods of letters.

A pox on alternative practitioners

I often report on experiments to test alternative medicines of one kind or another. One I

did was on a fellow who had chicken pox. The doctor told him there was nothing he could do for it, other than staying home and keeping away from people for 10 days. He was a bit of a skeptic and went along to some alternative practitioners. The first one told him his stomach was too acid and gave him some homeopathic water to drink. The second hooked him up to a contraption and told him he had been raped as a child. The third one said he had Ross River fever. They all charged from \$50 to \$100.

I've also written about experiments with acupuncture, which works just as well if you stick the needles in at random.

These pieces invariably attract writers defending the treatment and accusing me of having a closed mind. The disgruntled people usually argue that acupuncture, iridology or homeopathy worked for them or their husband or their wife, and that's the end of it.

Cosmic energies down on the farm

Then there's biodynamics. The stars and planets rain down astral energies, which are absorbed through cow's horns buried in the ground. This radiates out and makes everything grow. The colour of roses is controlled by Venus, and the colour of cornflowers by Saturn. In the Wellington public library there are four copies of Rudolf Steiner's book, published in the 1920s, and they're out all the time. Steiner really was the father of organic farming, but the organic people get very angry at me when I point this out. I get an enormous response if I write about Steiner, not only from his followers, but also from organic farmers who think they are above this sort of thing.

Genetic Engineering: yesterday's issue?

I've done three or four articles on genetic engineering over the years, reporting on various experiments. Living in New Zealand you'd think the entire GE field was being closed down, but in fact in all continents of the world it is spreading at a huge rate. The peasants in China and Africa who are producing genetically engineered crops find they don't have to use so many pesticides. But when I wrote about this in 2001 I got a tremendous response from angry people who wanted to keep New Zealand GE-free. And two years later, the same thing happened. The next time I wrote about it there were not so many letters, and when I wrote a pro-GE article early in 2009 I didn't receive a single letter. So things have gradually quietened down; GE is no longer

the terrible thing that people perceived it to be.

The Mormon blacklist

Generally I try to keep off religion but occasionally I stray in that direction. I got into big trouble when I wrote about the Mormon Church. The Mormons

On the scientific evidence, if you're in line for heart surgery, stop people praying for you.

claim that Jesus went to North America and converted the inhabitants to Christianity 2000 years ago. They also believe that the Red Indians are one of the tribes of Israel, although DNA studies show there's no possible connection.

I wrote about that, but I also found that Joseph Smith, the founder, was a complete rascal and charlatan. He was expelled from the Methodist Church for dealing with necromancy, enchantments and believing in ghosts, and fined for being a disorderly person and impostor. At age 38 a mob of vigilantes enraged by Smith's arrogance, monetary deals and promiscuity – he ran off with all the best looking girls in the congregation – shot him dead in an Illinois jail. The Mormons of course think he was a martyr to his cause. At any one time the Mormon church is building at least 200 churches around the world.

I thought this was worth reporting, because at the time there were some men on Norfolk Island in trouble with the law for playing up with the girls. I

made the mistake of saying it was no wonder they were acting so strangely, because they were all Mormons up there. They were very quick to point out that they were in fact Seventh Day Adventists. I had to write a grovelling apology, but found that I'd been put on the Mormon blacklist. When I consulted the list to see who else was there I saw I was in very good company with all sorts of famous people, including Richard Dawkins. I'm afraid I've got no future with the Mormons.

The power of prayer

One of the biggest responses I got was when I wrote about unanswered prayers. America's Templeton Foundation are very interested in the relationship between science and spirituality; they raised \$2.5 million to finance an experiment in which several doctors chose 1800 patients who were due for bypass surgery. They then arranged for a team of people, a mix of Protestants, Catholics and Jews, to pray for half these patients anonymously.

They were alarmed to find that the ones they prayed for did worse than the ones who were not prayed for.

I also mentioned the famous study by Charles Darwin's cousin, Francis Galton, who wrote a book about the efficacy of prayer. He asked who gets prayed for most – Queen Victoria of course. She was prayed for every Sunday as were all the sovereign heads of Europe. His figures showed that, despite all the praying, sovereigns lived shorter lives than army officers, traders, merchants, doctors, and

the gentry. And he famously concluded that the prayers therefore have no efficacy. Well. The letters still keep coming. I got letters saying that faith can't be scientifically analysed, that God's way of working is a mystery, and that science can't determine the effects of prayer at all. Someone else said people of faith don't need prayers to know that prayers work. One argued that some of the people having operations would have had extra prayers – they prayed for themselves. Other critics said they had used the wrong prayers, in the wrong language, that they didn't pray hard enough, or that they didn't adopt the best posture for saying prayers.

A local priest wrote to me twice, explaining in great detail that there are two sorts of prayers. There are petitionary prayers, where you beg God's intercession, which hardly ever work, and adorational prayers, where you simply praise God. If you want to get results, he said, do this. Don't ask for favours. It sounds as if the Muslims are on the right track; all you have to say is God is great. On the scientific evidence, if you're in line for heart surgery, stop people praying for you.

Tourism on Ararat

In Auckland a couple of years ago two young men developed a system for making maps from satellite imagery. They'd been looking closely at Mt Ararat and some Americans were financing them to go there to see if they could find Noah's Ark. The story in all the newspapers was all about these pioneers going to a really difficult place, breaking new ground, and how nobody

had done this sort of work before. I pointed out that for 2000 years people had been going up Mt Ararat and there are hotels and a monastery up there. There's a well-worn track; thousands of people go up and down all the time. A whole tourist industry has been developed there.

The difficulty with this, of course, is that no boat can accommodate 5000 species of mammals, 8700 birds, 30,000 worms, and two million insects. The column of beetles would be 240km long, and Noah and his family must have each carried 100 diseases from anthrax to syphilis. How Noah coped with food for the animals, the ventilation, the waste disposal, disembarkation on to a dead Earth, and how the platypus got from Mt Ararat to Australia are all very difficult to explain. A retired clergyman wrote me several, quite substantial letters as a result.

A letter from the Hamster

I've written one or two columns on the Creation Museum in Kentucky. In it are depictions of life in the Garden of Eden, and of a happy Adam and Eve, wandering around among the dinosaurs. I gather that 40 percent of Americans believe that humans and dinosaurs were on the Earth at the same time. I produced a column on the museum last year, which generated no response here, but someone at the museum itself must have read it. Ken Ham, the Australian who runs it, was upset. He replied, point by point, to all the mistakes I'd made. I had made one or two mistakes but they were trivial. I said he'd raised US\$27 million to build it; he said he didn't raise the money,

a trust raised the money. I said he had a radio station and broadcast stuff around the world; he said he didn't have a radio station, he just produced programmes. These are run by 287 other radio stations around the world. He wrote a letter to the editor of the paper and suggested I get the sack for my mistakes.

Filthy sex aids and the end of the world

I once wrote about the beginning of the world, and got an 11-page letter telling me when the world is going to end. The letter was from none other than God and his wife. They told me that the Earth would end shortly before January 31 in the year 5000. Owing to the mental and physical condition of humanity and filthy sex aids, mankind become unable to reproduce about then. There was lots of other advice as well, about divorce and the number 7777 and how the true church is the Salvation Army. Sadly, I couldn't reply to God, because there was no forwarding address. I did notice it was sent from a post office down in Manners St, Wellington, however.

Scientific gossip

Why do I write this stuff? Well, \$170 a week is very welcome, but I think that a vast amount of science goes unreported, and it gives me quite a buzz to bring news of this. I feel a bit like a postman, bringing news of developments and scientific gossip to the public. Also, there's a sense of obligation to the public who paid for me to work as a scientist for most of my life. I feel a duty to let them know what they're getting for their

money. We're floating around in a miasma of superstition, with people believing preposterous things with great intensity. I can't help but challenge them in some way: ask them, how can you justify this, where do you get these ideas from?

I derive a lot of joy from writing these articles. It's very different from writing for scientific journals. There you sweat blood and tears and produce a piece, which is then published years after you submitted it. Eighteen months later somebody in Mozambique or the Canary Islands asks for a reprint. With these newspaper articles I write it today and it's published tomorrow. And people are on the phone or writing complaining letters the next day.

Bob Brockie is a Wellington biologist, columnist and cartoonist.

Witch-hunting ancient and modern

Claire and I have taken a year off to teach English in the Czech Republic. These two photos are our friend Lada indicating the site where Agatha Toott was burned to death 400 years ago.

Agatha Toott was convicted of being a witch and burned at the stake. Contemporary records indicate that she was guilty of nothing more than being outspoken and perhaps a little eccentric. The brass memorial plaque is an effort to keep alive her memory and remind people of the consequences of ignorance and hysteria.

I would like to propose a brass memorial plaque be placed outside the site of the Christchurch Civic Creche, in memory of

Peter Ellis, his co-workers and the unfortunate children caught up in events reminiscent of a modern witch trial, fueled by the ignorance and hysteria of certain people who ought to have known better.

Pozdrav od,
John and Claire Welch



evolutionary psychology

Is science just mysticism in a lab coat?

Bernard Beckett

Some fields that claim the authority of science may be in need of an overhaul. This article is based on a presentation to the NZ Skeptics 2009 conference in Wellington, 26 September.

IHAVE always been in two minds about scepticism. I am undoubtedly a sceptic by nature; I enjoy questioning and challenging things. It suits my temperament and I like to think adds something important to a

discussion. But a true sceptic must be sceptical about scepticism too, and it's hard to escape two weaknesses in the scepticism agenda. The first is oft noted. As the British philosopher Roger Scruton puts it, when a sceptic

tells you nothing is true, they are telling you not to listen to them, so don't.

Of course, few confessed sceptics are sceptics in this pure philosophical sense. In some

things we must opt for mindless belief in order to function. Without our commitment to notions of causation for instance, or other minds, or time, or the rules of logic, we would be unable to make much headway in the world; yet none of these core principles are able to withstand the sceptic's gaze. And so, quite sensibly, we do not look there. The typical sceptic, it seems to this outsider, is more a champion of an evidence-based form of something we might call scientism. Their mission becomes the challenging of those forms of knowledge which appear to pay scant regard to the available set of observations. The trouble here is that limited resources mean there are only so many places the sceptical gaze can shine and choices must be made. Sometimes prejudice will determine which knowledge is scrutinised and which is left alone, or worse still, laziness. It is all too easy to attack the hapless for our own amusement, while leaving the powerful unchallenged.

The second problem is one of 'busybodyism'. I myself have little time for quackery and superstition but most of the time I find it hard to care whether others share my perspective. Yes, it is clearly wrong for those pretending to talk to the dead (or rather pretending the dead talk back) to exploit the grieving, but to those who enjoy recounting their ghost stories and snorting their arnica I tend to feel why not leave them to it. Who am I to say my life's any richer for having forgone such flim-flammy?

It is with these caveats in mind that I turn my attention to evolutionary psychology. Here

is a refuge of shysters that by and large is not subject to the same level of attack endured by astrology, which is odd to me, for the methodologies are remarkably similar. I suspect it's got something to do with the fact that it happens not in the tents of a gypsy fair but within the hallowed hallways of academia, and better still often within spitting distance of the science faculty. And to allay my second concern with scepticism, I have little trouble being a busybody in this area for the simple reason that the activities of academics are so often tax-payer funded, and given the vital role of academia in protecting and advancing knowledge it's quite okay to hold these people to a higher standard.

So, why be sceptical about evolutionary psychology? Well, because it's not scientific in its approach and yet attempts to hide behind the language of science, and to me that feels like an intellectual fraud. I can't make that claim without first defining what I mean by science and given the millions of words that have been written on the slippery topic I'm clearly going to have to oversimplify.

The basics of the scientific method are well known. At heart this is a discipline based upon observation, hypothesis making, prediction and testing. The remarkable power of science to advance our knowledge stems from the ability to test the claims we are making against the data, and crucially this data is at its most powerful when it is generated by the hypothesis, rather than representing a cobbling together of the already known facts.

Before the General Theory of Relativity, nobody imagined that light would be bent by gravity. When Eratosthenes predicted the angle of the sun as measured by the shadows in a well shaft would be different at the same time of day, he was using the hypothesis of a curved earth to generate a novel prediction (and so test his hypothesis). When Fresnel's equation predicted that light waves would produce a bright patch directly behind an obstacle he forced the French academy to rethink their acceptance of Newton's particle theory of light. And closer to home, when David Penny and Mike Hendy working out of Massey University predicted that species relatedness would produce particular patterns in as-yet untested genetic sequences, they gave us a way of verifying the evolutionary hypothesis.

In all these cases and so many more we are awestruck by the power of science to not just explain existing facts, but also generate new ones. If you look at X under circumstances Y, I predict you will see Z, says the scientist. And what's more, if you don't then my theory is at least partially wrong. On the back of this method we have developed the technologies that underpin the modern world.

Evolutionary psychology, the claim that understanding our evolutionary past will help us better understand our contemporary behaviour, has none of these attributes, although at first glance it can appear to. Ostensibly the discipline seeks first to read the known data, our understanding of the evolutionary processes by which we were designed, then

build its hypotheses, speculations about the behavioural tendencies of modern humans, and finally using the tools of psychology to test these hypotheses against the observations of our contemporary behaviour. Unfortunately, any resemblance to actual science is entirely coincidental. For evolutionary psychology as it is currently practised contains three crucial flaws.

The first comes from the requirement that a hypothesis, in order to be tested, must make a unique prediction. If two hypotheses both generate the same prediction, then experimentation will yield no means of deciding between them. Take the claim for instance that certain aspects of our appreciation of art are innate. Well yes, that's a sensible enough idea, it may well be true

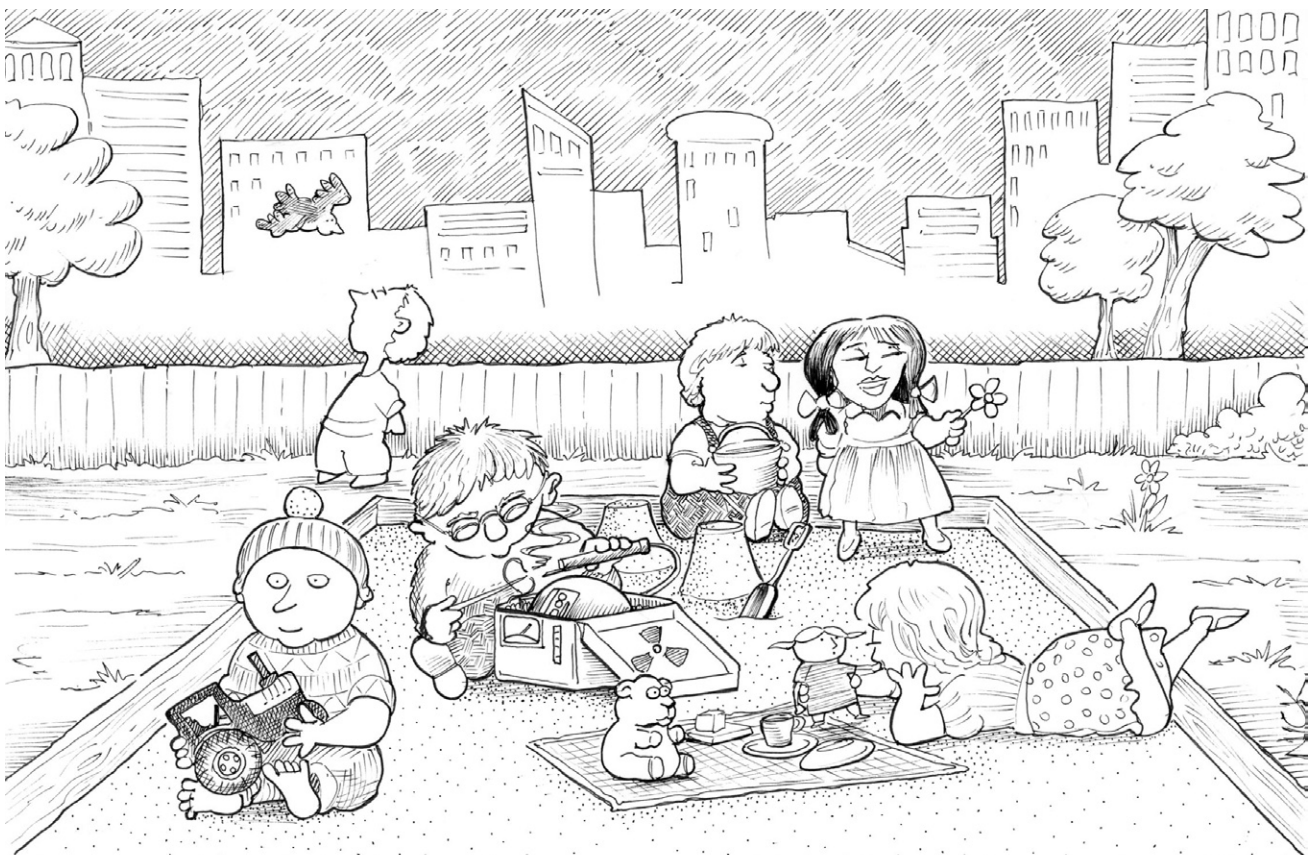
and although difficult to test, it's probably not impossible. Commonalities across time and culture provide clear hints that there is a genetic component at work.

However, and here's the rub, there is nothing about evolutionary theory that gives it exclusive right to this claim of innate aesthetics. A creationist could equally well argue that God himself endowed humanity with these basic tendencies to assess and report upon the world's beauty. Both hypotheses generate exactly the same predictions and this is a clear sign the evolutionary part of the process is not a scientific one, for in science predictions are used to choose between rival explanations.

A second huge problem is that we don't actually know much

about our evolutionary past, and so the blocks with which we build our initial hypotheses are spectacularly inadequate. Sometimes, when reading the claims of the evolutionary psychologist, it is tempting to imagine the savannah was fully equipped with CCTV cameras and Facebook. Complex stories are built about social structures, hunting and collecting rituals and mating preferences, and what emerges is a rendering of our evolutionary past that owes more to the Flintstones than any compelling archaeological evidence.

Take for example the initially persuasive claim that the difference in the reproductive potentials of men and women led to men (competing to mate with as many as possible) the aggressors, and women (attempting to raise the healthiest possible) the



If all children are natural-born scientists, society might be wise to at least quarantine the subset of these scientist-infants who are the atomic weapons specialists, before they kill us all with their crazy little lunchbox nukes.

choosey co-operators. A cave man version of the courting practices of birds is evoked and because the language used is faux scientific, we are expected to buy the construction.

Again, it is possible that our distant ancestors arranged themselves this way but it is by no means certain. It is equally plausible that the emergence of language and complex culture changed the game completely, selecting against male aggression and for charm and social acumen. While Conan is out smiting all with an ass's jawbone, Romeo is inside the cave getting to know his wife. We have examples from the primate world of females being the dominant aggressors and more importantly the emergence of complex language sets the human ape apart, generating unique selective pressures that we can only guess at.

The key moments in the evolution of the human mind revolved about the invention of language and so it is worth asking the evolutionary psychologist, how did language first come about, where and when, under what environmental pressures did it develop and what was it used for? Until we can answer these questions, and perhaps some day we will be able to, we do not have the basis the theory requires.

This second flaw exposes the third problem. We are not in fact using data from the past to form hypotheses about the present state of the human mind. Rather we are using our observations and testings of our current psychology to speculate about the nature of our evolutionary past. We are reversing the entire

scientific process. Because we observe modern males indulging in more physical forms of aggression we guess this is innate (an heroic assumption in itself) and then cobble together an evolutionary 'Just So' story to give these modern prejudices the veneer of social respectability. And that is story telling. It is often diverting and frequently amusing, but only in the way that a horoscope is.

What's actually happening is that contemporary studies of human psychology, which should be judged purely upon the contemporary data they generate, have their credibility bolstered by an appeal to a distant past that exists only in the imagination of those wishing to sell their theory.

Do men and women in general use different methods to get their bearings? A lot of experiments suggest they do. Okay. Is there a genetic basis for this? We could certainly look for one. Does a cock-and-bull story about how men roamed further in their hunting of animals while women paid close attention to the details of where particular berries would be found add anything to our knowledge of this phenomenon? Well, it adds colour and saleability I suppose, but that is a lousy criteria by which to judge scientific advancement.

How has all this happened? One can only speculate. Partly it may be the thrill that comes to academics when they cross into a new discipline. Suddenly everything is fresh and exciting again, and the new perspective gives them great energy. Partly it's just that we all love a good story, particularly when so many

of the tales in the area centre around the eternally fascinating topic of gender.

So should we be sceptical about these works of fiction parading as scholarly analysis of our past? Absolutely. We should mock them with the same gusto we mock the water diviner and the investment adviser. So come on sceptics, this is a call to arms. Out the phonies wherever you find them.

Interestingly none of this means we should give up on the field of evolutionary psychology completely, for the hypothesis does have one testable and important implication. If indeed our evolutionary past has hard-wired certain behavioural tendencies then clues of this process will still lurk in our DNA. Longitudinal studies like the groundbreaking work coming out of Dunedin are beginning to mine the potential in this approach. But the work is long and painstaking, the conclusions complex and tentative and subject to constant revision.

The picture slowly emerging is one of delicate feedback between gene and environment and the stories to be told are cautious, fragile things. Real science in other words, is potentially about changing the face of our future. That's where the resources should be going.

Bernard Beckett is a High School teacher and writer. In 2005 he spent a research year at the Allan Wilson Centre for Molecular Evolution and Ecology.

Autism paper binned

TWELVE years after it induced panic among parents world-wide, a paper linking the measles-mumps-rubella (MMR) vaccine to autism has been withdrawn (NZ Herald, 4 February).

The paper, published in the *Lancet* in 1998, was withdrawn after a preliminary verdict by a panel from Britain's General Medical Council found Dr Andrew Wakefield and two of his co-authors had acted "dishonestly" and "irresponsibly".

"It has become clear that several elements of the 1998 paper by Wakefield et al are incorrect," the *Lancet's* editors stated. "... In particular, the claims in the original paper that children were 'consecutively referred' and that investigations were 'approved' by the local ethics committee have been proven to be false. Therefore we fully retract this paper."

The paper was based on just 12 children, some of whom had bowel disorders and autism which had developed after vaccination with MMR. It led to sharp falls in vaccination rates and, said Auckland University's Immunisation Advisory Centre director of research Helen Petousis-Harris, many preventable cases of disease.

"There are still many parents who are concerned about the Wakefield claims. We hope that this news [the retraction] will add further reassurance that the MMR vaccine is not associated with autism or any other developmental problems."

The *Lancet* announced a partial retraction in 2004 after it emerged that Dr Wakefield had received payments for his research from the Legal Aid Board which he had not declared. This was a fatal conflict of interest, the journal said.

Stargazers at odds

Obviously, it came in the middle of the silly season when papers struggle to find copy, but journalist Rebecca Lewis had a lot of fun with astrologers' predictions for the year ahead (NZ Herald, 3 January).

Pitting one astrologer against another, she checked out what various authorities in the field had to say about Sagittarians. A certain Anne McNaughton picked 2010 as a year in which a full moon in the "financial sector" would get things off to a good start for them. On the other hand Jenny Blume in *Woman's Day* reckoned changes at work and home would leave Sagittarians feeling "skint" in autumn.

Someone on the Universal Psychic Guild website calling herself Astrogirl reckoned they would ditch their club-hopping ways and start "nesting". Marie Claire promised the coming year would be about being daring and outgoing, and **astrology.msn.co.nz** claimed 2010 would bring out the "practical" side of Sagittarians, with a primary focus on finances.

"Confused?" asked Lewis. "Yup."

The truth is in there

UFO researchers UFOCUS NZ are excited at the prospect of hundreds of secret files on mysterious sightings which are to be released by the New Zealand military (The Press, 23 January).

The files cover the period 1979 to 1984, and include the famous Kaikoura sightings of December 1978. They were to have been public in January, but are having personal information removed first to comply with the Privacy Act.

UFOCUS NZ director Suzanne Hansen said the group had been in discussion with the NZ Defence Force for many years. "It is frustrating from a research perspective because we would like to collate these sightings with international research."

New Zealand Skeptics chairwoman (sic) Vicki Hyde said the files would not be as interesting as they appeared. "The Government is required to log these things and it can give a false impression that there is a vast amount of activity out there."

"There is probably intelligent life elsewhere, but whether it has come here to play silly buggers with us in a game of cosmic hide and seek is another matter."

"It is a big jump from 'there was something in the sky and I don't know what it was' to 'that was a craft piloted by aliens'."



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Scientists to the rescue

Among all the tragic stories coming out of the Haiti earthquake was the strange tale of John Travolta flying his own private jetliner to the beleaguered country with 7000lb of medical supplies – and doctors and ministers from the Church of Scientology (NZ Herald, 27 January).

Scientists at a hospital in the capital Port au Prince said they were healing patients through “the power of touch to reconnect nervous systems”.

Sylvie, a spokeswoman, said: “We are trained as volunteer ministers. We use a process called ‘assist’ to follow the nervous system to reconnect the main points”.

“I didn’t know touch could heal gangrene,” said one sceptical doctor.

St Bathans a ghost town?

An Invercargill man on a ghost-hunting trip to Otago has come away with a spooky photo – but not of the building that’s supposed to be haunted (Southland Times, 5 February).

Andrew Watters had gone to St Bathans to have a look at the Vulcan Hotel and its supposed ghost. The pub apparently had only the regular type of spirits and it wasn’t until later that a friend noticed in one of his photos a shape in the upstairs window of the old post office nearby that looks remarkably like an elderly woman.

Vulcan Hotel leasee Jude Cavanagh said it was the first she had

heard of a ghost sighting at the post office. “It’s a very spirited town, so who knows?”



Dead letter office: Is that a ghost in the upper right window? Enlarged at lower right.

The post office, managed by the Department of Conservation since the 1950s, had been vacant for about a year, at least in the bodily sense, she said.

Ghost, or reflection of a cloud? I suppose we’ll never know...

Sweat lodge ends in tragedy

A sweat lodge at an Arizona “spiritual retreat” ended up steaming three people to death last October, according to a leaked police report (NZ Herald, 4 January).

The retreat charged thousands of dollars for five days of motivational talks and spiritual tasks. Following the deaths, self-styled guru James Arthur Ray faces a murder investigation.

The report showed participants vomited, passed out and screamed for help. Ray was outside the only entrance, controlling the flap that let people in and

out. One witness said Ray told scared participants three times: “You are not going to die. You might think you are, but you are not going to die.”

The two-hour ceremony followed two days of fasting and not drinking water. When the ceremony was over and people were trying to get the victims out, Ray called attempts to remove blankets from the walls “sacriligious”. One victim had been subjected to such intense heat his lungs were scorched.

Critics say that such tasks are a sort of confidence trick that exists at the extreme end of America’s US\$11.5 billion (\$15.8 billion) self-help industry.

‘Ghosts’ find buyer

Two “captured ghosts” sold on Trademe have gone to a company which sells electronic cigarettes (The Press, 9 March).

The “ghosts” were sold by Avie Woodbury of Christchurch, who says they are the spirits of an old man who lived in the house in the 1920s and a powerful little girl who turned up after a ouija board session. They have been kept in holy water which “dulls the spirits’ energy”.

The auction recorded more than 200,000 page views and made international headlines. Safer Smoke NZ had bid \$5000, but the final price dropped to \$2830 after a last-minute bidder was revealed to be a fake seeking to push the price up.

Ms Woodbury will donate the proceeds to the SPCA – once exorcist’s fees have been paid.

An evening of healing

Noel Townsley continues our series on the psychic roadshows touring New Zealand.

FROM a website to which I subscribe came an email notice of two upcoming events with “well-known psychic” Jeanette Wilson. She was doing psychic readings one evening, and the following evening Spirit Healing, described as “an extraordinary evening, one that may change your perception of this reality forever.”

Having been to an unimpressive evening with the “well-known psychic” Sue Nicholson recently (see *NZ Skeptic* 93), I decided my usual Tuesday night pub quiz would likely provide me with more satisfaction, but I would attend Jeanette’s Spirit Healing evening and see what this was all about.

The venue was Rotary House in Silverdale. I arrived right on 7.30pm to a medium-sized hall. In the first and smaller of two rooms was a table with various items for sale, and someone to collect my \$40 pre-purchased ticket. From behind the dividing door I could hear Jeanette starting her talk and was quickly ushered through to a seat at the back. There were about 100, mostly older people, and definitely more women than men. I could see that quite a few, like me, had taken up a suggestion

in the advert and brought their cameras, hoping to get a photo of one of those seemingly elusive spirits.

Jeanette began by explaining that when she used the term “entity” she was referring to a spirit – often referred to as the “soul” in living people, and as “spirit” once they had died, but that all were interchangeable terms for the same thing. She also said that there were over 2000 spirit doctors and surgeons that she could call upon – these were the same ones that the famous John of God in Brazil uses, and like him, she was also dressed in white, as to better see the spirit/entities. She was also barefoot as this “grounded” her to the energies.

She said some doctors came more frequently than others and mentioned various names. None sounded like Louis Pasteur, Joseph Lister, or Christiaan Barnard. A number of saints were mentioned as well. She said she had recently done a very successful healing session in Palmerston North where she said that many orbs, entities, and even a floating face had been photographed. Things looked promising for tonight.

She then told us about her upbringing in England, her late

childhood in which she realised she could see spirit, and her dramatic call to heal. This came when, as a bank loans officer, a man who had come to see her about a loan asked her to heal his bad back. Not sure what to do, she muttered the prayer she had learnt only a few months earlier while attending a healing workshop.

The result, she says, was for three entities to appear. One took over her body; the other two took the man (now lying down presumably), one by his feet and the other by his head, and proceeded to stretch him out straight, with much loud moaning from the man. If her next loan appointment was waiting outside, I wonder what they thought. Eventually the moaning subsided and the man claimed his back was much improved. The next day he went to his chiropractor, who reportedly said his back was now perfectly aligned.

News of this healing incident spread quickly, and she was soon unpopular with the healing school, who considered her to be a novice. However, while waiting at the tube station, an old man walked up to her and told her she was a healer, repeating this several times. When she realised

he was “not of this world”, the man promptly vanished, but she now knew what she was destined to do.

Jeanette related another story of how she was asked to see an (unnamed) peer in the House of Lords, who was due to swim the Thames in a week’s time for a charity event, but was unable to free a frozen shoulder. She was able to fix this in a few minutes, and her fame spread quickly, to the extent that she was being hounded by the unwell – rather like Princess Diana had been by the paparazzi, she said.

Expectations

Jeanette then told us about some of her recent healings and what we could expect to experience. These healings she said usually happen within a few minutes, or even within a few seconds of her working with someone. Also, as she was healing, we would likely see auras, orbs of light, or even a healing entity. The entities, she explained, do the actual healing; she is just a conduit for them. She warned us that at times she would be making quite loud noises, but not to be concerned by this, and also to have our cameras ready, as this was the best time to take photos and perhaps capture an image of an entity, orb or aura, as this was when they were most active. We may also notice that the room, or parts of it, may become hot or cold – this would be a result of the energies, she said.

She explained she believed in a higher power, although she did not adhere to any particular denomination. We were then asked to close our eyes and recite the Lord’s Prayer, followed by a

rosary if we knew it, to assist us in the night’s healing session.

Jeanette asked if there was anyone that had a visible physical condition, rather than a sore back for example, that was just qualitative. This, she said, was to visibly “prove” to us that healing was going on. Several hands went up, including an elderly lady in the front row, with a pair of crutches to her side. Jeanette asked her name and what was wrong with her. Her name was Iris she replied, and she had a problem with both feet, ankles, legs, and knees, which resulted in her being unable to walk any distance without crutches or use of a wheelchair. “I’ll come back to you Iris,” Jeanette said, and asked again if there was someone with a smaller observable condition.

A woman said she was unable to lift her left arm above her head and demonstrated the lack of mobility. Jeanette got to work, rotating both hands in small circles very quickly about half a metre from the “patient” (as she often referred to them) and at the same time making a continuous “Eeee” noise. As she worked she again reminded us this was the time when spirits/entities would likely appear. She advised that the rapid movement of her hands was not controlled by her, but by the entities, although it seemed to make her puff a bit.

During a break in the “Eeeee’s” she asked if anyone had taken any photos of orbs etc. Although I had seen and photographed nothing, one person near the front said they had, and a woman in a purple sweater near the back of the room ecstatically claimed that she could currently

see a purple aura around the patient, and also a single entity just behind her. During the break I overheard someone say that the woman who saw the entity was also a psychic.

Jeanette continued to work on our first patient’s problematic left shoulder but then moved to the right side, directed by the entities. After a few minutes, with breaks for attempts to lift both arms, it appeared that the patient could now lift her right arm up further than she could before; however the problematic left arm remained defiantly down.

All-knowing entities

Jeanette explained that the entities, who she said had scanned us all as we entered the hall this evening, and see and know everything, often fix things that they consider to be of more benefit to us than we do, in some cases even fixing things we didn’t know we had. She assured our patient though, that she would gain more movement in her left arm later on, and presumably considering that getting the right arm to lift higher made for a successful healing, asked for a round of applause for our patient, and a new person to come forward.

Our next patient was a man who had a visible condition, trigger finger in both hands, which he said he had had for about four years. Jeanette said that in her experience, the longer the condition had persisted, the harder it was to heal. She began again with her rapid hand movements and the “Eeeee’s”. During breaks in the healing process the patient revealed that he also had a lot of damage to his back due to an accident that also caused him pain.

Jeanette then said she had a pain in her back, which was a sign the entities had directed her to work on this area too. After a few minutes our patient claimed his back pain was improved, and there was some improvement in the trigger finger. However, at least from the back of the room, there appeared to be no difference in the fingers. Another round of applause for our patient, and then Jeanette directed herself to the previous patient, Iris.

Energy flows

Iris revealed further details of her condition; she had apparently damaged one knee in an accident, for which she was currently awaiting reconstructive surgery. Jeanette explained that all energies flow in and out of our feet – good energy flows up, bad energy flows down and out, so in Iris's case her feet and ankle problems were due to blockages, which in turn created her knee problems.

Someone from the audience asked Jeanette to check with Iris if she had ever been bitten by something, as this might have caused her problems, as apparently it had done in themselves. Iris was sure she had not been bitten however. Jeanette worked on Iris for some time, getting her to stand up from time to time and try to walk a step or two without her crutches. She worked on Iris's shoulders which the entities had indicated were a problem – left shoulder is past responsibilities, right shoulder is future responsibilities, Jeanette explained.

Iris looked like she might have been from a rest home, so hopefully she would not have too

many future responsibilities to deal with, but if she did, at least she now had a strong right shoulder to cope with them. After a quite lengthy session, and despite Jeanette's efforts, and Iris's willingness, Iris seemed unable to make any progress in walking, and still resorted to her crutches, but as she returned to her seat, Jeanette said that she would experience an improvement in the next three days. A further round of applause followed.

**Several weeks on,
I cannot report any
improvement in my
hearing at all, but I will
certainly let you know if
there is.**

During this part of the evening Jeanette had often asked the audience if they could feel the hot or cold energy around them. No one indicated they did, but maybe, as it was a hot and sticky summer evening in a room with no air-conditioning, this was too much for the energies to overcome.

A pause for breath

A break of about 20 minutes gave us an opportunity to take refreshments and look over the table of books, CDs, Jeanette's upcoming courses, and various items including crystals, the Nu-Me pendant, and a radionic pendulum. The pendulum appeared to be nothing more than a small pear-shaped piece of wood attached to a string; however it was far more, as my later research on the internet revealed.

This pendulum, sculpted by the Aetherius Society's craftsmen, is claimed to be an excellent tool to help develop your intuition and psychic abilities. "It reacts with the subconscious and higher conscious minds to give physical movements with the swing of the pendulum. With the correct use, you can tap the forces of intuition within yourself and then, by careful experimentation, many things can be determined."

The Nu-Me pendant appeared to be a small coil of copper, about the size of a 50 cent piece. The manufacturers claim it "balances the personal energy system (chakra balancing and aura clearing) as well as protecting from all disturbed energy including EMF (Electro Magnetic Frequency) POLLUTION."

The courses currently on offer by Jeanette include Reiki – \$3000 to become a Reiki Master, and a Spirit Healing weekend, for an "investment" of only \$300.

The second half

Upon our return to our seats, I noted a few more empty chairs than before the break.

Jeanette went back into her healing routine on a few more patients. I cannot report that any of the patients in the second half showed any marked physical improvement either. One gentleman, who had a sore shoulder which he said he had injured, but ACC had said was due to arthritis, was unable to lift his arm up fully above his head. Jeanette said that ACC was wrong in their assessment; it had been injured, and she was going to have to make very loud noises to ensure a healing – a high impact

(accident) meant a high impact (sound) was needed to correct it. Following each healing action Jeanette would ask the man to lift his arm up, each time declaring a small improvement, although she acknowledged that he was not fully healed, but assured him the improvement would continue. As the crowd applauded, he returned to his seat. A review of photos from my camera showed that he could lift his arm no further on his first attempt, than on his last.

The finale

The last part of our evening was to be a mass healing by Jeanette. We were asked again to close our eyes and recite the Lord's Prayer, and a rosary if we knew it, to assist this process. She advised that, as well as healing our own ailments, we could think of others and heal them remotely as well. We were to put a hand on the area that we felt needed healing, but if that area was embarrassing, or hard to reach, we could put our hand on our heart instead, as the entities would know what needed to be healed anyway.

The other important thing to remember was not to open our eyes during this time, as the negative energies being released could enter our bodies this way and undo any healing – a warning worth heeding. As I lost about 95 percent of my hearing in my right ear in a diving accident, I put my hand over my right ear and hoped for an improvement.

The only thing that happened at the time was that the constant tinnitus I also experience seemed to get a little louder. However, she did say we could expect more

improvement over the coming days, so I was still hopeful.

Several weeks on, I cannot report any improvement in my hearing at all, but I will certainly let you know if there is.

Her last word of warning was to those who had been through her healing – because they had been through spiritual surgery, which was just like conventional surgery, the same advice applied – they must not exert themselves, lift heavy weights etc for some time. This seemed at odds with her claims that healing happens within a few minutes, and could replace conventional surgery. The recovery time at least, would appear to be the same from either “surgery”.

Gems of information

Amongst the gems of information that Jeanette gave out during the night was that a doctor (unnamed) had shown that cats purring can cause broken bones to heal quicker – one compensation of working at the SPCA I guess. She also said that another (also unnamed) doctor has discovered that people with cancer all have acidic bodies, and that changing your diet to make it alkaline will ensure you do not get cancer.

She also revealed some predictions – that New Zealand will be the first country to have full (presumably independently verified?) healing using her method, and will also be the first to open a crystal hospital – I took this to mean one that uses healing crystals, rather than one made of crystal, as the cost would be phenomenal.

In conclusion, I saw nothing that evening in any of the

“patients” to indicate a marked or even a mild improvement in any visible condition, although some were reportedly healed of ailments they did not know they had. Those that claimed to be in less pain invariably still walked with a limp, or had difficulty mustering the affected limb to do anything it could not do before. I think most of the non-critical thinking people in that audience would say they saw proof of healing that night, judging from the queue of people wanting her to autograph their newly purchased books at the end of the evening.

I found it intriguing that Jeanette's claim that aches in one part of the body indicated a non-physical problem, eg sore hands, means difficulty dealing with issues, seemed to be accepted by the audience – obviously the body is not as complex as we have been led to believe.

I was also puzzled by her statements that energy leaves and enters our bodies via our feet, but when asked to pray for our own healing we had to keep our eyes closed as bad energy can enter through our open eyes and affect the outcome. Also puzzling was her claim to not be of any religious denomination, but we were asked to recite a Christian prayer and the Roman Catholic rosary.

In regard to the auras, entities and orbs, I saw none, although one photo I took does have a circular, semi-transparent, white spot in it. As, in the same picture, I can clearly see the bright down-lights located in the ceiling, I think it is safe to assume that this was in fact lens flare. As for the claimed peach/orange

coloured auras that were supposedly captured by some, I think this can easily be explained by the profusion of digital cameras in use, most of which produce a red/orange light in low light level situations to assist them to focus. The light emitted is roughly circular, and of course is aimed at the point of interest – in this instance Jeanette and the patient. With so many cameras in use, in-

evitably someone taking a photo will be recording these focusing lights in their pictures.

My concern with Jeanette Wilson is that people might see her claims of healing as a viable alternative to conventional medicine, and so forgo treatment. To her credit, Jeanette never suggested to anyone that they do that, but conversely, she never

suggested to anyone that they seek conventional treatment for any of their ailments.

Despite Jeanette's claim in her advertisement, my perception of this reality remains firmly intact.

Noel Townsley is a credit controller living in Auckland.

After the overdose

Vicki Hyde and David Riddell

NZ Skeptics link up with a British campaign against homeopathy.

ON January 30 there was a concerted global mass overdose – but no-one died because the 'medication' was homeopathic. The event grew from the UK-based 10:23 campaign (www.1023.org.uk), which was planning a mass homeopathic overdose to protest against the Boots pharmacy chain stocking homeopathic products.

At a Christchurch Skeptics in the Pub meeting (skepticsinthepub.net.nz) four days before the planned date, one attendee asked if the NZ Skeptics were going to be involved. After all, we had asked a number of times over the years for the professional pharmacy bodies to supply a conference speaker to talk about the ethics of selling products of doubtful efficacy. Things swung quickly into action...

We held the mass overdose in Christchurch's Cathedral Square,

with about 40 people taking part. The event also included an 'underdose' – homeopaths believe



Got to be good for you: Ursula Rose samples homeopathic champagne outside Christchurch Cathedral.

that the more dilute things are, the more potent they become, so we were careful to try that approach. There are also claims by product manufacturers that, in fact, dosage doesn't matter at all – whether you take one pill or 100 – the important thing is the frequency of dosage. We covered that base too. No ill effects were reported, apart from a distinct drop in the level of cash in various wallets. While several members were keen to take part, many said they couldn't in all good conscience bring themselves to buy the stuff in the first place. For the demonstration, we reluctantly purchased two boxes of tablets and a 25ml spray from a Unichem pharmacy, costing \$51.95. That's a lot to pay for less than two tablespoons of water and not much more than that in lactose milk sugar.

One of the homeopathic products downed by the participants

had a label saying it contained chamomilia, humulus lupulus, ignatia, kali brom, nux vomica and zinc val. But those substances were actually in homeopathic dilutions, meaning that the kali brom, for example, was present in a proportion comparable to one pinch of sugar in the Atlantic Ocean – that is, not actually present at all.

Reaction

The pre-publicity from the Christchurch Press saw the New Zealand Council for Homeopaths admit publicly that *their products had no material substance in them* (our emphasis).

Council spokeswoman Mary Glaisyer said (maryglaisyer.com/2010/01/press-release-mass-overdose): “there’s not one molecule of the original substance remaining” in the diluted remedies that form the basis of this multi-million-dollar industry. This point was picked up by a columnist in the Guardian, who referred to the NZ homeopaths as finding “amusing and creative ways to dig themselves deeper into a hole”.

We got a flurry of interest in the first press release from TV, radio and print media, as well as great support from members, Skeptics in the Pub folk and others concerned about this issue.

TV One ran a very short news item on it; there was a longer,

more thoughtful piece on TV3 News.

On TVNZ the Pharmacy Guild was quoted saying of homeopathic products: “there’s a place for them so long as customers are told they only *may* help”. We believe that that is unethical, and certainly that comment was not made at any of the pharmacists we visited to purchase these products.

TVNZ’s Close Up national current affairs programme covered the story on February 12. They spent two hours filming us swallowing pills, spritzing

Christchurch Skeptics in the Pub gatherings.

That sterling effort was then diluted to a very short intro followed by a short interview sequence involving Vicki Hyde and Mary Glaisyer. Following on from this, we decided to put up a challenge of our own to the NZ Council of Homeopaths to join the campaign to call for pharmacies to stop selling homeopathic products, as both groups are opposed to the practice, albeit for different reasons.

The New Zealand Council of Homeopaths and others in the trade have stated that their cus-

tomers require lengthy personalised sessions to “match the energy of the potency of the remedy with the person”. According to Mary Glaisyer, this involves matching symptoms with the huge range of materials on which homeopaths base their ultra-diluted preparations. For example, causticum, more mundanely known as potassium hydroxide, is said to manifest its homeopathic action in “paralytic affections” and “seems to choose preferable [sic] dark-complexioned and rigid-fibered persons”.



Anything yet? Vicki Hyde waits for a homeopathic preparation to take effect while TV news cameras look on.

Claire le Couteur

sprays, demonstrating how a homeopathic dilution is made, talking about the health and safety issues of relying on water as a medicine and a whole host of other issues, in the cosy confines of The Snug at the Twisted Hop, the bar of choice for the

Pharmacists who sell homeopathic products in the same way they sell deodorants and perfumed soaps are clearly not meeting basic homeopathic practice. When a number of pharmacies in Christchurch were checked by purchasers of these products, no pharmacy staff

asked about symptoms; one simply asked “do you want vitamins with that?”

Many people equate homeopathic products with herbal products, hence the belief that the products contain real substance. In addition, the products are commonly used for conditions which get better with time regardless of treatment, as well as exploiting the well-known placebo effect.

The call for the NZ Skeptics and homeopaths to join forces is not the first time such action has been considered. In 2002, when an Auckland pharmacy starting selling products labelled homeopathic “meningococcal vaccine” and homeopathic “hepatitis B vaccine”, we discussed with the late Bruce Barwell, at that time the president of the NZ Homeopathic Society, a joint release condemning this highly dangerous move. We were concerned that relying on water as a vaccine would lead to unnecessary deaths.

It’s bad enough when the product labelling misleads people into thinking they are buying something more than water. It’s far worse when they misuse a word like vaccine in such a life-threatening area.

The homeopaths were concerned then, as now, that their 200-year-old practices were being misrepresented by non-homeopaths keen to benefit from the multi-million-dollar industry.

A recent survey showed that 94 percent of New Zealanders using homeopathic products aren’t aware that the remedies

commonly contain no molecules of the active ingredient – their homeopath or health professional hadn’t disclosed this. The customers believe they are paying for the substances listed on the box, but those were only in the water once upon a time before the massive dilution process began – along with everything else that the water once had in it – the chlorine, the beer, the urine...

You have to ask, at what point does it shift from being an issue of informed consent to become an issue of fraud?

Do pharmacists not know that homeopathic products are just water, or they do know and don’t care because people will buy it not realising the massive mark-up? Either way, that should be a big concern for the health consumer. Here’s a huge industry with virtually no regulatory oversight or consumer protection or come-back, and even its keen customers aren’t aware of the highly dubious practices involved.

When Billy Joel’s daughter attempted to commit suicide in December, she chose to take an overdose of homeopathic medication, and thus suffered no ill effects. While that case was fortunate, there are many cases where people have been harmed by the use of homeopathic products in the place of real medicine. There is a Coroner’s Court record of the death of a baby from meningitis; it had been treated with homeopathic ear drops and the mother was very reluctant for any hospital admission. And the website **whatstheharm.net** lists many cases from around the

world where people have died or had horrible outcomes as a result of a mistaken reliance on homeopathy.

The alternative health industry has built a multi-million-dollar business exploiting the natural healing powers of the human body, as many conditions will get better within two to three days regardless of whether conventional or alternative treatments are used, or even if nothing is done at all. Independent testing has shown that homeopathic preparations take full advantage of this and homeopaths quickly take the credit for any improvement in their clients.

The NZ Skeptics have already had people asking for a list of ethical pharmacists that they can support with their business. We are happy to hear from any pharmacy willing to take a stand on this issue, and will start to create a database for concerned members of the public.

From the UK 10:23 campaign:

Thanks very much for the note, the support and the energy. We have been overwhelmed by the enthusiasm from the NZ side of things. It’s been great.

To mark the occasion, the NZ Skeptics have released a new Skeptics Guide to Homeopathy, available as a flyer on the website (**skeptics.org.nz**). It outlines the development of homeopathy from a relatively harmless attempt to help people some 200 years ago through to the multi-million industry of today.

Belief and knowledge: a plea about language

Alison Campbell looks at some words that cause scientific misunderstandings.

ISUSPECT that for many of my first-year Biology students, the sheer weight of new terms they come across is perhaps the most daunting thing about the course. In some ways learning biology is rather like learning a new language, with several thousand new words swamping the page (and the brain).

But there's more than just the new words – there's the meaning of the words to come to terms with. This is the focus of Helen Quinn's paper in *Physics Today* (2007): *Belief and knowledge – a plea about language*. There are many words whose meaning to a scientist may be quite different from what they mean to a layperson. Quinn feels, and I agree, that some words "are the root of considerable public misunderstanding about science: belief, hypothesis, theory and knowledge."

'Belief' isn't really a word that sits well with science. As Quinn says, it can be "an article of faith" ie religious belief. Or – conversely – in the phrase "I believe he is coming at 5pm", you get the meaning "but I'm not really sure." So how are we to take those news stories that begin "Scientists believe"? A statement like "most biologists believe in evolution" could be used to claim that evolution is as much faith-based as organised religion. (I tell my students that I don't 'believe' in evolution, but accept it as the best available

current explanation for life's diversity. This can engender some interesting discussions...)

But what the statement "most scientists believe" means – to scientists – is that most scientists agree that the weight of evidence favours a particular interpretation. Quinn suggests we should say "scientific evidence supports the conclusion that..." I like this – it leaves open the possibility that this conclusion could change, if sufficient evidence to the contrary comes to light. Which is a much better reflection of the nature of science. Unfortunately there tends to be a perception that scientific 'facts' don't change. (Also unfortunate is the fact that if scientists do change their interpretation of the data, they're accused of not really knowing what they're talking about. Sometimes I think we just can't win!) Like Quinn, I feel that as scientists we shouldn't be using the 'b' word – it gives the appearance that science is "just another belief system."

'Theory' is another word that means different things to different people. "I've got a theory about that" really means, 'I've got a hunch or an idea, a guess.' But to scientists 'theory' means a well-established explanation for a large body of data: the theories of relativity, plate tectonics, evolution... These are definitely not guesses (nor are they belief systems!), but comprehensive explanations that have strong

predictive power and have been tested time and time again. They are also incomplete, but that again is the nature of science. Scientific theories may well be modified if new evidence comes to hand: Newton's laws are an example. (Quinn notes that Newton's laws still hold, under certain well-defined conditions.)

It's worth repeating Quinn's description of how scientific theories are developed, because this is a valuable description of how science operates and what sets it apart from 'other ways of knowing':

When we seek to extend and revise our hypothetical frameworks, we make hypotheses, build models, and construct untested, alternate, extended theories. These last must incorporate all the well-established elements of prior theories. Experiment not only tests the new hypotheses; any unexplained result both requires and constrains new speculative theory building – new hypotheses. Models ... play an important role here. They allow us to investigate and formulate the predictions and tests of our theory in complex situations. Our theories are informed guesses, incorporating much that we know. They may or may not pan out, but they are motivated by some aspects or puzzles in the existing data and theory. We actively look for contradictions.

Alison Campbell is a biology lecturer at Waikato University.

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Coming soon: NZ Skeptics Conference 2010

Registration is now open for the annual New Zealand Skeptics' Conference, to be held at Butterfly Creek, Tom Pearce Dr, Auckland, 13-15 August.

Fill out the form in this issue, or register on-line at www.skeptics.org.nz

See you there!

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