The worst speculative Sceptic ever I knew,
was a much better Man than the best
superstitious Devotee & Bigot.
David Hume

The physiology of placebos

Magnetic underlays

Superstition survey (Part 2)

new zealand Skeptic

number 91 - autumn 2009

www.skeptics.org.nz

content

ISSN - 1172-062X

Contributions

Contributions are welcome and should be sent to:

David Riddell
122 Woodlands Rd
RD1 Hamilton
Email: number8@ihug.co.nz

Deadline for next issue:

June 10 2009

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 IBM-compatible disk is appreciated.

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

editorial

The supernatural retains its appeal

ALTHOUGH formal religion is continuing to decline in this country, belief in the supernatural remains high. That seems to be the main conclusion to be drawn from a recent survey of New Zealand religious affiliations and attitudes carried out by Massey University as part of the International Social Survey Programme.

The survey of 1000 people found 40 percent of respondents said they had no religious affiliation compared with 29 percent just 17 years ago. Fifty-three percent said they believed in God, although half of those said they had doubts, and 20 percent believed in some form of higher power. Professor Philip Gendall, who led the study, said there had been no change in the proportion of those who say they believe in a higher power. "The survey shows that God is not dead, but religion may be dying," he said. Fifty-seven percent believed in life after death, with 51 percent believing in heaven and 36 percent believing in hell, the survey showed.

Of particular interest to skeptics were the responses on superstitions, though these were only a small part of the overall study. A quarter thought star signs could affect people's futures, 28 percent said good luck charms work and 39 percent said they believed fortune-tellers could foresee the future.

Perhaps we can take some comfort in the fact that those figures are all well under 50 percent, but they're still high. It would be interesting to see reliable, up-to-date figures for attitudes in New Zealand towards alternative medicine, creationism, mediums, UFOs, and the various claims of the alternative archaeology crowd. Some of those I suspect would be really alarming.

I'm not aware of any formal attempt to carry out such a study. The closest would be last year's Sunday Star-Times survey, of which the second half of Vicki Hyde's response is printed in this issue. Respondents in that were a self-selected subset of the paper's readership – hardly a random sample of the entire country. All the same, where comparisons could be made, results are fairly comparable with the Massey survey – eg 40 percent of respondents said they believed in God with another 10 percent not sure, which could be rephrased as 50 percent believing but 10 percent uncertain, quite similar to the Massey figures. About 44 percent thought it was possible to foresee the future, which is again close to what Gendall's team found. So even though the Sunday Star-Times survey's prime objectives were to entertain and to sell papers, it seems it may have provided a useful snapshot of New Zealanders' attitudes to the paranormal.

The physiology of the placebo effect

Martin Wallace

Placebos may contain no active ingredients, but they have real effects on the human brain. This article is based on a presentation to the NZ Skeptics 2008 conference in Hamilton, September 26-28.

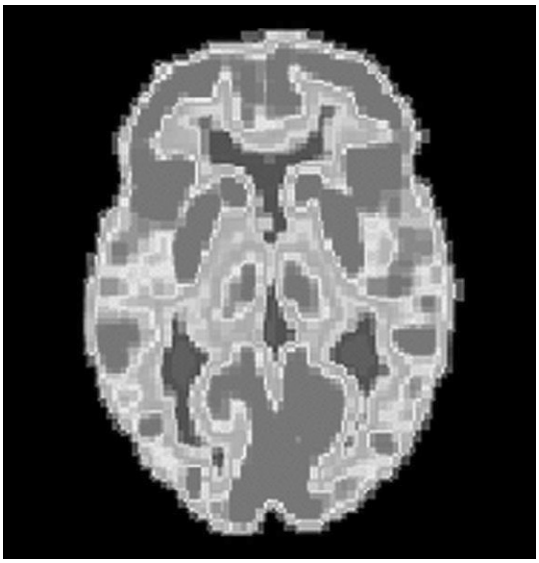
EARLIER this year, Dr Tipu Aamir of the Auckland Pain Management Service drew my attention to something peculiar. In a double-blind, randomised, placebo-controlled trial of morphine after a standard knee operation, 30 percent of those receiving a placebo get pain relief. When those people are given a specific morphine antagonist ('antidote'), their pain comes back! In the words of a former contributor at an annual conference of this society, this was an epiphany. I needed to know more.

After all, how could something that was 'all in the mind' be changed predictably by a substance with a known pharmacological action?

Any study of homeopathy raises the issue of the placebo effect. As a result of a meta-analysis in 2005 of a number of studies comparing homeopathic remedies with orthodox treatment, Shang et al stated in their conclusion that the effect of homeopathic remedies was no greater than that of a placebo. Not that they had *no* effect, but it was *no greater than that of a placebo*.

We skeptics are often happy to accept the explanation that if a response to some arcane practice is a placebo response, that settles the issue.

Over the last 30 years there has been a large amount of research into the undoubted effects of placebos. I thought it might be of interest to review this work in the context of our frequent use of 'placebo effect' to explain the unscientific.



What does 'all in the mind' mean? Placebos generate real changes in brain function.

Placebo is a Latin word for "I shall be pleasing, or acceptable". It is the first word of the first antiphon of the Roman Rite of the Vespers for the Dead (!), Placebo Domino, dating from the seventh to ninth centuries. Chaucer called one of his characters Placebo in the Merchant's Tale, because the word had come to mean a flatterer, a sycophant, or a parasite, by the 14th century.

> "Placebo seyde:
> Ful little need had ye, my lord so deare,
> Council to ask, of any that are here
> But that ye be so ful of sapience."

He also uses it in the Parson's tale: "Flatterers be the Devil's chaplains, which sing ever 'Placebo'."

In the 1811 edition of Hooper's Medical Dictionary, placebo was defined as "an epithet for any medicine adopted more to please than benefit the patient". In a recent edition of Collins' Concise Dictionary of the English Language it is defined as "an inactive substance administered to a patient to compare its effects with those of a real drug, but sometimes for the psychological benefit of the patient through his believing he is receiving treatment".

However, placebos do benefit patients, and they are certainly

not inactive in the context in which they are given.

The most dramatic example of this that I saw in clinical practice involved a young man on artificial kidney treatment. When erythropoietin became available for the treatment of the severe anaemia seen so often in this situation, he was the first patient in our unit to receive it. Erythropoietin is a hormone made in the healthy kidney, which increases the number of red cells in the blood and the amount of the oxygen-carrying haemoglobin. The synthetic version has achieved notoriety as a performance enhancer in sport, for example in the Tour de France. We were all very enthusiastic about this improvement in management for our patient, and he was given his first dose with much interest from all of us. That night he went home, recovered his bicycle from the shed where it had been undisturbed for many months, and rode all around his town with great energy and pleasure. He hadn't heard the information that the drug took three weeks to act on the anaemia.

We are left with some questions. What was the physiology of his sudden ability to exercise at a 'normal' rate, long before there was any change in his blood count? What does 'it's all in the mind' mean? Was he somehow at fault, or was it me and the staff who were lacking in understanding?

I would like to consider:

- The psychological processes involved in the placebo effect
- The physiological mechanisms in the brain
- The site of this activity in the brain
- Why there is variation in the placebo effect from individual to individual
- What are the implications for the classical drug trial format?

There must be a physiological cause for placebo analgesia.

Psychological mechanisms

Those who study the psychological processes of the placebo effect cite two major mechanisms.

Conditioning. Pavlov (1849-1936) showed that dogs given meals as a bell rang would subsequently salivate when the bell rang despite not being given food. This process has been explored in humans, who will experience pain relief when a placebo is substituted for a pain reliever when a sequence of active analgesia has been associated with an environmental cue. It is an unconscious process. At the nerve cell level, conditioning leads to a stronger and more sustained response.

Expectancy. This effect is seen when the patient has 'great expectations' of the substance being given. These are raised by the conscious or unconscious attitude of the therapist. It is a conscious process on the part of the patient.

It is currently suggested that both conditioning and expectancy are active in the placebo effect, and that in fact, as an inert placebo can have no effect per se, what we see is the effect of the *context* in which the treatment is given.

Neurophysiology of placebo pain relief

Over the last 30 years, there has been much interest in the neuro-physiological mechanisms of the placebo response.

In 1975, Hughes et al identified in the brain two related pentapeptides (a chain of five amino acids linked together) with potent opium-like action. There are many more now identified. These compounds act on specific receptors on the membranes of neurones, and via intracellular metabolic changes increase synaptic transmission. They are made in the pituitary and hypothalamus, and are called endorphins.

A digression

In pharmacology the term *agonist* denotes a drug with an effect, and *antagonist*, a drug which specifically blocks the effect of the first substance.

When I spent a year in the pharmacology lab in Dunedin (1959) it was becoming recognised that drugs exerted their effects by way of a specific receptor molecule at the cell surface. The actions of adrenaline, for example, were explained by the presence of two different molecules to which it could attach, which mediated different effects. Noradrenaline would latch on to only one, explaining its more limited range of action. With their usual desire for learned coherency, pharmacologists called them *alpha* and *beta* receptors.

Antagonist molecules attach to the receptor molecule and block access by the agonist. Hence the term 'beta-blockers'. These are substances which block the action of adrenaline on its beta receptor. They are widely known for their action in the control of blood pressure, and recently for their unwanted effects when given to protect patients at risk of heart trouble when undergoing operations.

Agonists and antagonists are related by similarities in molecular size, shape, and charge.

Morphine antagonists have been available for some time. In 1961 as a house surgeon in casualty, I was asked to manage an opium addict, brought in because he was deeply unconscious, and breathing perhaps once a minute. He had been without the drug for some weeks, due to market fluctuations. When access was resumed, he used a dose which was the same as his habituated dose. This was much more than he could now tolerate. I had access to nalorphine**,** a specific morphine antagonist, and 30 seconds after an IV injection, the patient took several deep breaths, sat up, expressed considerable surprise at his surroundings, and then lapsed back into his former state. I was able to repeat this dramatic procedure several times until he recovered!

In 1978 a group of dental surgeons working in California (Levine et al) carried out the following experiment. Patients who had had an impacted wisdom tooth extracted were treated routinely with nitrous oxide, diazepam and a local anaesthetic. At three hours after the procedure they were given either a placebo or naloxone, a specific morphine antagonist. At four hours they were given a placebo or naloxone.

Those who had initial pain relief with the first dose of placebo (39 percent), when given naloxone had an increase in pain.

The authors concluded that "this was consistent with the hypothesis that endorphin release mediates placebo analgesia in dental postoperative pain."

The elegance of this study lies in the unequivocal evidence that a supposedly psychological state (placebo analgesia) was reversed by a specific opioid antagonist. Note that none of the patients was given morphine. There must be a physiological cause for placebo analgesia.

This sort of study has been repeated many times, and always naloxone reverses placebo analgesia.

The site of action of opioids in the brain

The site of this process has been determined. The sites for opioid receptors in the brain can be found by specific cell staining methods and histology on brain tissue. But more exact, 'real-time' evidence comes from positron emission tomography (PET) scans.

Another digression

PET utilises short half-life radioactive elements which undergo spontaneous beta decay. In the process, they emit a positron, which collides with an adjacent electron resulting in mutual annihilation, and the generation of two high-energy photons at a near-180 degree angle. These can be detected, and with many, many such events, used to build up a tomographic picture of the source in relation to surrounding tissue. In the studies of the brain, radioactively-labelled glucose is injected, and congregates where activity (utilisation) is greatest. PET scans are used to monitor metabolic activity in specific organs. For example, the extent of heart muscle damage after a heart attack.

In 2002, Petrovic et al were able to show that both opioid and placebo analgesia are associated with increased brain activity in specific regions: the anterior cingulate cortex and the brain stem. There was no increase of activity in these regions with pain only.

Similar localised brain activity has been shown in placebo responses in Parkinsonism (dopamine) and some depressive states (serotonin).

I find these studies exciting and provocative.

Genetic predilection

A further question can be asked in the light of the evidence for a physiological mechanism for the placebo effect. Why does it occur in only 30-40 percent of us for a given situation? It may occur in a greater proportion of a population sample if the context is made more convincing. But why don't we all have the benefits? Variation in a physiological function begs the question of a genetic predilection.

De Pascalis et al (2002) have shown that individual differences in *suggestibility* contribute significantly to the magnitude of

placebo analgesia. The higher the suggestibility score (there are several tests available) the greater the placebo analgesic effect.

As early as 1970, Morgan et al showed that there was a correlation of suggestibility between monozygotic twins but not dizygotic (fraternal) twins. (Monozygotic twins are the result of the fertilisation of one ovum by one sperm. The resulting zygote splits into two cells which each develop into an individual. These individuals have exactly the same genes.)

Wallace and Persanyi (1989) looked at hypnotic susceptibility and familial handedness. Subjects with close left-handed relatives scored lower in a test for hypnotic susceptibility.

At the 2008 conference, I carried out an experiment with a group of clearly non-suggestible Skeptics. I asked those in the audience to raise their hands if they, or a close relative, were left-handed. If the hypothesis was correct, more than 10 percent of our attendees should have been left-handed. In the event, 22 of 84 attendees indicated they or a close relative were left-handed.

The control study should be done with a church congregation, Protestant or Catholic. In fact, we could do this on *both* and answer the question as to which is the less suggestible! I haven't had the nerve to ask.

Thomas Bouchard, beginning in 1979, has carried out a number of studies on twins who for a variety of reasons were reared apart. He compared correlations between identical twins and between fraternal twins. The studies from his group (in Minnesota) have shown a large group of correlations in identical twins reared apart, which do not occur in fraternal twins reared apart. The correlations differ very significantly. Table 1 has some examples in twins reared apart:

Similar studies have given similar results in Australia and Western Europe.

Meanwhile at the end of the garden, the security situation had deteriorated. A breakaway group of radical pixies had started making enriched geranium.

Because the nurture of these twins is different, and identical twins have identical genes, the similarities must be genetic**.** This approach to behaviour has lead to the science of behaviour genetics.

(Physical attributes are of course also correlated more between identical twins reared apart, than fraternal twins reared apart.)

Amir Raz (2005, 2008) and his group in New York State have shown that a genetic polymorphism (more than one version of a specific gene) exists for a gene on chromosome 22, which codes for an enzyme active in the breakdown of dopamine**,** a neurotransmitter. One amino acid substitution (valine for methionine) in the gene alters the enzyme activity by a factor of four times. Since we have a copy of this gene from each parent, we may have val/val, or val/meth, or meth/meth genotypes.

Val/meth heterozygote confers the greater suggestibility. The enzyme is called COMT or catechol-o-methyl transferase.

Brain pathways in which opioid receptors are active are linked to those in which dopamine is the transmitter (nerve to nerve). If there is genetically conferred variation in dopamine activity it is likely that this will influence the result of changes in activity in the opioid pathways.

We must remember that we are talking of a genetic predisposition to be suggestible, and not a gene for suggestibility. It is not that 69 percent of identical twins vote Republican, but that

	Identical Twins	Fraternal Twins
Religious fundamentalism	62%	2%
Broad religiosity	58%	27%
Right-wing attitudes	69%	0%

Table 1. Correlations in attitudes of twins reared apart.

if one does there is a 69 percent probability that the other one does too.

The implications for drug trials

In 2003, Benedetti and his colleagues in Turin examined pain relief in patients after thoracotomy. Patients were allocated to either open infusions of morphine, with information about the efficacy of the drug, or to receive hidden doses of morphine by infusion without any information and without any doctor or nurse present (the open / hidden model for drug trials).

With the same dose, same infusion rate, same timing and same drug, pain relief was less in the 'hidden' group.

In the 'open' group, the 'meaning-induced' expectations had enhanced the drug effect.

This research group has gone on to postulate that in all drug treatment the effect is the sum of actual physiological effect and the effect of expectations. This means that the placebo effect will always cause part of the usual 'physiological' response to active drugs.

They say that the classical double blind randomised placebo-controlled trial does not allow for expectation effects, and may suggest that a drug has a specific effect greater than it actually has. They suggest an 'open/hidden paradigm' will give more meaningful results.

Conclusions

- The analgesic placebo effect is accompanied by a distinct, observable, and locatable physiological event in the brain.
- Susceptibility to the placebo effect varies in the population at large.
- This susceptibility is at least in part genetically determined.
- It may be possible to harness this facet of human behaviour for the benefit of individuals, and to prevent its on-going exploitation by charlatans.
- Although placebos are inert and cannot have any effect on the healing processes, their meaning and the context in which they are given can.
- All drug effects include some placebo effect, except when the drug is given surreptitiously. This should alter the classic clinical trial structure.

We have come a long way from the Vespers for the Dead!

Placebos are inert substances but the context in which they are given can alter neurophysiology in such a way as to cause subjective *and* objective effects.

This is not due to the 'molecular memory' of water, nor to strange force-fields as yet unknown to physicists. It is due to our human nature, how we react to our environment, and the relationship, between our minds and our bodies.

Full references available from the editor.

Martin Wallace is a retired physician with special training in kidney disease and its management, and a degree in pharmacology in addition to the MB., ChB. Since retirement he has had time to resume his education in other fields.

Magnetic underlays: what's the attraction?

Ian Luxmoore *investigates the claims for BioMag underlays.*

I HEAR and see advertising for the BioMag Underlay on a regular basis in New Zealand media. They advertise extensively on TV and radio and have become a very well-known brand in this country. They produce a wool bed underlay that includes magnets which are promoted as providing pain relief. There are several other brands of magnetic underlay in the market in New Zealand and the conclusions here most likely apply to those as well, but for simplicity I focused my efforts on the most popular one.

The first step is to see what the BioMag actually claims and in the age of the internet the

best resource for this is usually the company's website (**www.biomag.co.nz**). In this case BioMag have a pretty good site which is easy to follow and has a lot of information on it.

While their claims are restated in several different ways in different parts of the website, this premise really stood out:

> "For years, the mainstream medical establishment's response to pain has been to throw a pill at it."

While there is some evidence that drug prescription rates are higher than necessary, any doctor trivially throwing pills at a problem would soon lose his or her practising license. The fact is that mainstream pain relief *does work*. It works effectively, time and time again, in clinical trials beyond count and in day-to-day life.

The website's claim looks like an attempt to trivialise mainstream medicine so that people will be more inclined to consider the BioMag. This is not an uncommon tactic amongst alternative medicines and it also builds on the cynical view of drug companies held by many. They promote the BioMag as drug-free pain relief for a variety of ailments from arthritis to sciatica and numerous other causes to take advantage of this.

It is important to note here that nowhere do they say that the BioMag *cures* anything but it does claim to reduce the pain from various ailments. Some magnetic healing devices claim to cure cancer or other serious ailments and I think it is clear these are fraudulent, but the BioMag does *not* claim this as far as I can tell.

How Does It Work?

So how is BioMag supposed to do what it claims? There are a myriad claims on the website. The main one however is that circulation is improved, and the connection between magnets and iron in the blood is invoked to explain this. They go on to explain:

> "It does this by drawing trace elements, for instance, iron, towards the magnets. The human body contains about 5 grams of iron, much of it in the form of haemoglobin which plays a vital role moving oxygen from your lungs around your body."

Firstly if the magnets do attract the iron in your blood won't that just draw the blood towards the bed and hold it there? Logically one would expect it to do the exact opposite of increasing circulation. However that proves to be irrelevant because the iron in the body is locked up in haemoglobin molecules and is so diffuse that it is incapable of forming any kind of magnetic attraction. In fact it turns out that haemoglobin is actually slightly *repelled* by magnetic fields.

Perhaps the best response to the claim that magnets affect blood however was made on a blog entitled Crap-Based Medicine:

> "The last time you got an MRI, did the enormous magnets tear all the blood out of your stupid body?"

MRIs are magnetic resonance imaging devices at hospitals that use very powerful magnets (0.5-3.0 Tesla) to create 3D images of the body. To put the power of these magnets in context, the biomag magnets are probably around the 0.01-0.05 Tesla mark so if anything was going to move blood an MRI would!

The second claim the BioMag makes is that the magnets stimulate nerve endings:

> "The general consensus is that the magnetic force stimulates nerve-endings to improve blood flow to injured or swollen joints, causing the blood vessels to dilate."

There are numerous papers exploring the impact of magnetic fields on nerve actions, and the results are quite variable. One common thread though seems to be that the mechanisms are largely unknown. One paper I found that *did* find an effect made the point that the strength and nature of the magnet need to be quite specific to have an impact on isolated mouse nerve impulses.

Even if the nerve endings are stimulated by magnets and this does lead to increased blood flow, if there is pain there then the nerves are *already* stimulated and the blood flow is already increased! The magnet has no work left to do. Moreover it seems very unlikely that a general magnetic field from the underlay would stimulate nerves only in places where there are injured or swollen joints – in fact one might expect the magnets to dilute this effect given that, if it does stimulate nerve endings, it would stimulate them *everywhere*. All told this line of reasoning simply doesn't add up.

The BioMag site also claims that increased circulation increases the delivery of trace elements and nutrients around the body and aids in the removal of toxins. Both of these are irrelevant to the main claim of pain relief and are also highly suspect.

Other claims include influences on melatonin production (to aid sleep) although a 2003 paper by Touitou et al discovered large magnetic fields had no effect whatsoever on melatonin levels.

Finally they claim that the BioMag can correct excess acidity or alkalinity to bring the body "into a position of natural balance". There is no obvious connection between magnets and pH levels, and it is worth noting that various parts of the body have varying pH levels for different purposes so one would hope these levels aren't all affected.

Evidence

I can find absolutely *nothing* on the website or elsewhere that indicates the product itself has been tested for efficacy in pain relief and sleep improvement. The BioMag site offers some journal papers and anecdotal evidence. I will deal with the anecdotal information in the next section.

The main reference on the site is to a 1997 paper entitled Response of pain to static magnetic fields in postpolio patients: A double-blinded pilot study, by Vallbona et al. There are a few points to note about this paper. Firstly it is a pilot study which is a rather tenuous basis for an entire product line. Secondly they only applied the magnets for 45 minutes which is quite different to sleeping on them overnight. Thirdly there was no follow-up so while this paper is potentially interesting, it doesn't really tell us very much at all.

Good science is built up on as many studies as possible in order to give us the best possible picture, *especially* in highly subjective areas like pain. Twelve other papers are listed on the site but to save time I went hunting for any meta-analyses of static magnet therapy. A meta-analysis is where the author compiles the results from as many studies as he or she can find and determines if there is an overall benefit to be found given the breadth of studies conducted.

I found a 2007 meta-analysis that looked pretty thorough entitled Static magnets for reducing pain: systematic review and meta-analysis of randomized trials, by Pittler et al. This paper pulled together 29 studies, including the Vallbona study and most of the other references listed on the site. Their conclusion is telling:

> "Overall, the meta-analysis suggested no significant effects of static magnets for pain relief relative to placebo."

They did note that for one ailment (peripheral joint osteoarthritis) the "evidence is insufficient to exclude a clinically important benefit" but for all other ailments their conclusion was that there was no significant effect over placebo.

At the very best one can say that the literature is uncertain about the impact of magnets. What we can say is that there appears to be no peer-reviewed research about the BioMag products specifically and therefore its clinical efficacy rests on the somewhat inconclusive (and mostly negative) evidence for magnets in general.

The anecdotal evidence

While clinical evidence for the BioMag's efficacy is sparse at best the anecdotal evidence is all over their website and advertising campaigns. Anecdotal evidence is much harder to take seriously than clinical evidence because it is uncontrolled and wide open to placebo, misinterpretation and even manipulation.

The BioMag site particularly emphasises the celebrities that endorse the product. While not an uncommon tactic amongst both legitimate and illegitimate products, ask yourself this: is a rugby star any more qualified than anyone else to comment on the efficacy of a bed product? Celebrities they may be. Sleep experts or medical doctors they are not. Their opinion is no more or less valid than any other lay opinion.

Looking through the testimonials page we find videos of several prominent celebrities doing promos on Murray Deaker's radio show plus numerous written endorsements on the site. I read through all the testimonials I could find and noted that, while every single testimonial mentions improved sleep, less than half specifically mention pain relief. In fact most of the video testimonials didn't even mention pain, but they did spend a fair bit of time on how nice the wool is! Notably almost none of the

To Page 12

Compiled by David Riddell

'Pet psychics' get a boost

THE flourishing pet psychic industry has received free publicity from an Australian article reprinted in the NZ Herald (23 January). I guess it was the silly season, that time of year when papers are scratching to fill their pages.

Featured most prominently was Melita, a West Australian who has been 'reading animals' for four years, and who gets about four calls a week for her animal psychic skills.

One client wanted her to shed light on the aggression issues of a dog that had attacked a kangaroo – it was like a teenager that needed booundaries, Melita said.

"I do know that people are more sceptical about animals than human beings because animals can't talk and so they find it a bit scary," she added.

Leonora, from Tasmania, said people were starting to understand that animals have souls.

Kersti Seksel, a Sydney-based specialist in animal behaviour, said she was sceptical about animal psychics, but there was no harm if they provided comfort for owners who were concerned about their pets' behaviour or mourning their loss.

"I would like to see scientific proof that it works," she said.

In a sidebar, an owner spoke of the comfort she gained from a message via a psychic from her dead Burmese, Max.

"I didn't have anything not to be peaceful about," Max reportedly told the psychic. "I had a complete life. When I was hurt, I was helped right away."

Gambia gripped by witch-hunt

Sometimes I have to think we've got it good in New Zealand. According to Amnesty International, authorities in Gambia recently rounded up 1000 people, forced them to drink hallucinogens, and to confess to being witches, in a campaign that is terrorising the West African country (Waikato Times, 19 March).

The human rights group called on President Yahya Jammeh, who came to power in a 1994 coup and has claimed he can cure Aids, to halt the campaign and bring those responsible to justice.

Authorities began inviting 'witch doctors' who combat witches to come from nearby Guinea soon after the death this year of the president's aunt. Jammeh reportedly believes that witchcraft was used in her death.

Mediums get job creation grant

Ana Samways, in her Sideswipe column (NZ Herald, 30 March), notes that the Daily Telegraph reports two Welsh psychics have been given a British Government business grant to teach people how to "communicate with the dead". Paul and Deborah Rees have been given £4500 ($11,300) under the Want-2Work job creation scheme.

The couple will use it to instruct people on how to contact friends and relatives "on the other side" at their centre, the Accolade Academy of Psychic and Mediumistic Studies. Mr Rees said the couple had to negotiate "a lot of red tape" to secure the grant: "They hadn't invested in psychics before, so we really had to prove ourselves." Good to know they don't hand out money to just anyone.

Art Instinct grabs attention

Well-known local skeptic Denis Dutton is riding a wave of publicity following the release of his latest book, reports the Otago Daily Times (21 February).

He's "getting the kind of exposure for which his fellow academics would wrestle sabre-toothed tigers," the paper says. The highlight was a spot on the top-rating satirical US television show, The Colbert Report (**www.colbertnation.com/the-colbert-report-videos/217078/january-28-2009/denis-dutton**).

According to Harvard psychologist Steven Pinker, The Art Instinct: Beauty, Pleasure, and Human Evolution, "marks out the future of the humanities – connecting aesthetics and criticism to an understanding of human nature from the cognitive and biological sciences".

But that's not why the book has gained the profile it has, according to the ODT. "When it comes to the Darwinian competition that is book marketing, Dutton actually has two secrets: sex and the Internet."

The sex part comes from Darwin's theory of sexual selection. The arts can be seen as the human equivalent of a peacock's tail, a form of display to attract the opposite sex. The internet is represented by the website Dutton founded, Arts & Letters Daily, "beloved of academics and media types around the world, where an ad for The Art Instinct flashed prominently onscreen for weeks."

Says Denis Dutton, "The hand of a certain view of the arts has had its clammy grip on all thinking".

That view is the 'blank slate' concept of human nature, in which the art we humans produce is seen as being entirely shaped or 'constructed' by culture, not genes.

Dutton rejects this notion. Culture is only part of the equation, he believes. The problem has been that philosophy "doesn't ask where the intuitions come from ... let's face it, a lot of it is uninformed armchair speculation by people who just happen to be geniuses: Hobbes, Mill, Kant. It's time to go over to the psychology department and see what they're up to."

Dutton wants to explain "how we became a species obsessed with creating artistic experiences with which to amuse, shock, titillate, and enrapture ourselves, from children's games to the quartets of Beethoven, from firelit caves to the continuous worldwide glow of television screens".

To take just a couple of examples – Why do people, when polled about their artistic preferences, seem drawn to realist paintings of a certain kind?

"What everybody wanted was the Pleistocene savanna landscape." The preference was ingrained in us during the Pleistocene era, during which our ancestors evolved into human beings, he argues.

And why is creative storytelling something humans everywhere value and understand? Well, for one thing, stories offer "low-cost surrogate experiences" that help us play out different possible scenarios.

The ability to imagine "states of affairs not present in direct consciousness" must have had "a huge adaptive power in human prehistory".

Business booming for kiwi psychics too

The economic boom for psychics in the US noted in last issue's Newsfront seems to be occurring in this country as well. (Newstalk ZB, 31 March)

With more people seeking reassurance in the face of the economic downturn, clairvoyants are experiencing a surge of new clients, it seems. They say since the start of the year, there has been an influx of people asking about the financial outlook.

Psychic Rose Goodliffe says most people are asking questions about their second source of income, such as the housing market. She says she is seeing far more property investors and people who own small businesses, but generally people want reassurance rather than specific advice.

Ms Goodliffe says her schedule is overflowing with bookings and for the first time she has had to introduce late night and weekend sessions.

New Zealand 'just as weird'

The Fortean Times is TV3 Nightline host David Farrier's favourite read, which his co-host says explains a lot. On a recent visit to London he visited the founding editor, Paul Sieveking (TV3, 27 March, available on Farrier's TV3 web page).

Named after paranormal enthusiast Charles Fort, the Fortean Times is a distinctly British magazine, but has more than 80 international correspondents.

"I have a carpet salesman in Turkey who translates the Turkish press," says Sieveking, "and it's teeming with UFO cases, and sorcery, and all sorts of Fortean stuff which the rest of the world is unfamiliar with because they don't read Turkish."

There's also quite a bit of material from New Zealand, which shows this country stacks up quite well "on the weird scale".

"You've got plenty of UFO cases, strange cryptozoological stories, strange corpses washed up on the beach, archaeological anomalies – stone walls that are pre-Maori."

testimonials made any specific mention of the magnets.

Explaining the anecdotal evidence

On the surface the anecdotal evidence seems convincing but it doesn't take too much thought to find a logical explanation for most of it.

Firstly the BioMag is a luxury woollen underlay for a bed and relatively few people that already had a high-quality woollen underlay on their bed would actually purchase a BioMag. This means that the *majority* of people purchasing one are actually significantly improving their bed's comfort and luxury. This in itself would be enough to account for a better night's sleep, the most common reported benefit.

Secondly a lot of people suffer problematic pain in bed. Once you are comfortable and asleep you don't feel pain so anything that makes your bed more comfortable and makes it easier for you to sleep will effectively alleviate pain. Also it is fairly well known that good sleep gives your body a chance to recuperate and that well-rested people are more likely to be motivated and lively. This builds a powerful explanatory scenario for the observed pain relief due to the BioMag.

Thirdly, a lot of people that buy this product *expect* to receive pain relief and better sleep. Given the cost, celebrity endorsements, and supposed science behind it, there cannot be a better environment for the placebo effect to manifest itself. Given how subjective pain is, if you curl up in a warm comfortable bed that never used to be that soft and comfortable it is no surprise that you'd think it was working and that would potentially increase the effect that the good sleep already has.

Conclusion

I think it is safe to say improving sleeping conditions is beneficial to people with all sorts of problems so it is most likely a benefit to installing a luxury wool underlay on a bed without one. However given everything I have read, the nature of the benefits of using the BioMag, and the general conclusions of the magnetic healing literature, I am strongly inclined to believe that the magnets do not contribute to any of the benefits of using the BioMag underlay.

Ian Luxmoore is a lecturer in Resource and Environmental Planning at Massey University and is currently doing a PhD in macroeconomic exergy modelling.

forum

Chiropractic argument 'spurious'

IN HIS previous Hokum Locum column (NZ Skeptic 90) John Welch commented on an article on Chiropractic that appeared in the Marlborough Express on 22 August 2008. This relied upon innuendo, blog sites, opinions and basic mistruths to validate a spurious argument.

Dr Welch was critical of the Nelson chiropractor John Dawson using the courtesy title 'Doctor'. Perhaps we should have the use of the title solely reserved for those people who actually have the post-graduate doctorates eg PhD's, etc. Thus all medical practitioners, dentists, chiropractors and vets would cease being able to use it.

On a matter of public safety, it was responsible of the Ministry of Health to prosecute Michael Dawson for calling himself a chiropractor, when it was illegal for him to do so. If Dr Welch has a problem with this then he should really take it up with the Ministry of Health.

If Dr Welch had bothered looking at the Chiropractic Board registration and examination processes and reviewed the moderator's report he would see that the procedure for registration is robust and fair (**www.chiropracticboard.org.nz**). The examination moderator has a medical degree and is very competent and well qualified.

The $100 million budgetary blowout that ACC is experiencing is the direct result of physiotherapy care within the Endorsed Provider Network scheme. It has nothing to do with the chiropractic profession.

The recent study of low back pain quoted by Dr Welch in Medscape (**www.medscape.com/viewarticle/580409**) made no mention of chiropractic, but did comment on manipulation. Dr Welch was incorrect in referencing this article to chiropractic care.

In regard to a patient that may have had a stroke as a result

of a manipulation of the neck, the most recent research (Cassidy et al, 2008: Spine 33(45): S176–S183) identifies that 80 percent of dissections of the vertebral or carotid arteries are pre-existing prior to any manipulative procedures (irrespective of the practitioner type). Cassidy found that a patient has as great a likelihood of experiencing a cerebral vascular accident following visiting their medical practitioner than they do visiting a chiropractor.

Every form of health care has its dangers. To discuss the dangers of chiropractic care, Dr. Welch should also have provided the mortality statistics for the use of Viox and other anti-inflammatories.

In the five-year period that Viox was available in the US, there were 88,000 additional heart attacks and 38,000 deaths. (Reference available.)

Everybody has a 'bad health care provider' story. In regard to Dr Welch's comments about chiropractic treatment of wisdom teeth, if it was true, then a complaint should have been made to the HDC.

I believe there is a special responsibility when one criticises other health care professions. The author should look at both sides of the issues, be objective and honest as well as referencing the articles properly. References should be peer-reviewed journals.

Justin Vodane
B.Soc.Sci.,B.App.Sci.
Chiropractor
Hamilton

Chiroworks?

John Welch's comments regarding Chiropractors led me to share this post from the 'Traffic Light Thoughts' series on my blog:

I'm not advocating graffiti but I must admit a desire to modify one logo I stare at every day, if the light is red, from "Chiroworks" to "Chirodoesn't".

Commuting means time spent sitting at traffic lights. Random thoughts occur in an attempt to fill the void. I call them Traffic Light Thoughts – **rcd.typepad.com/personal/traffic_light_thoughts/**

Robin Capper
Waitakere

Gonorrhoea and astrology

Well done for the excellent Summer 2009 edition of the NZ Skeptic. I thoroughly enjoyed it.

Dr Goodyear-Smith's article on non-sexual transmission of gonorrhoea highlights the degree to which the sexual abuse industry (including relevant law) is based on unproven assumptions, feminist propaganda, poor research and superstition. She is a brave seeker of truth whose contribution to our country will be seen as enormous, but possibly not until after she has been burned at the stake by those whose sacred cows she keeps threatening.

And Vicki Hyde, who tells those enquiring of her star sign that she is an Asparagus, might like the reply I often give to that sadly frequent question: "I'm an Aries, and Aries don't believe in astrology."

Hans Laven
Tauranga

Islamic creationism on the telly

I've been a bit disturbed by something the local Canterbury TV puts on. It is done as a paid hour, and comes with a disclaimer from CTV, but is a Muslim 'Voice of Islam' hour every Saturday night and Sunday morning. First time I saw it I was channel surfing late at night, and thought it was a nature documentary – the wonders of the animal world or some such – until it did the same thing as the creation science crowd and claimed that the eye/behaviour/structure was much too complex and only *their god* could have designed or made this!

Is Voice of Islam putting this stuff all over? It clearly has money behind it to 1) make the shows and 2) pay for two full hours each week. Sometimes you get talking heads, and some of it is quite amusing in its twisted logic at times. If this is being shown to half-literate or scientifically illiterate groups in other parts of the world, it is no better than the creation science people.

Change the name from Allah, and you wouldn't know it wasn't creation science stuff.

Louette McInnes
Christchurch

White-tail spiders: a web of misconceptions

John Welch

LINLEY Boniface is to be congratulated for her humorous take on the prevailing hysteria around alleged "white-tail spider bites" (Dominion Post 9 March).

An Australian, Dr Geoff Isbister, has done the most to debunk the belief that this Australian immigrant has been responsible for everything from limb amputations to ulcers and skin grafts. A careful scientific study has shown that a white-tail spider bite causes a small and painful red mark which is gone in a few days. The Isbister study required evidence of a bite as well as expert identification of the spider which had to be available for examination.

I found another false belief that white-tail spider bites possess a special toxicity because they feed on other spiders in the home, particularly the 'Daddy Long-legs'. There is no evidence for this and when I was corresponding with Dr Isbister he wittily referred to this belief as a "myth within a myth".

In the course of my work in the Emergency Department I have seen dozens of strange skin lesions which had been attributed to white-tail spider bites. I have only seen one case that I accepted as being a genuine bite. A young woman put on her slipper and felt a sudden sharp pain. When she removed the slipper a spider dropped out which she identified as being a white-tail. There was a small red mark. No treatment was necessary and when she phoned me a few days later the injury had completely resolved. Note that this account does not meet the strict criteria of the Isbister study but the outcome is similar.

Juicy Fruitless?

"Fruit juices with added extras such as herbal supplements may actually be harmful" – so says the Marlborough Express (10 March). Such products are aggressively marketed by advertisers using brand names such as 'Kickstart', 'Energy Lift' and 'Green Recovery'. Perhaps it was this product that helped the Green Party gain an extra seat in the last election!

An Australian consumer group (Choice) found that herbal extras did not actually contain enough extracts to have any meaningful health effect and some could have been dangerous. The claims of some were simply wrong. For example, one product claimed to contain greater than 30 percent of the daily omega three fats requirement. It actually contained only eight percent of the recommended daily dose for men.

Choice's advice is timely: "it's best to stick to the whole fruit or vegetable."

Internet mythology

Mike Bradstock writes: "I am a bit concerned by the number of anonymously written emails I get from well-meaning people telling me how to do an instant stroke diagnosis and suchlike. Have you encountered this sort of thing and is any of it well founded?"

Well, yes. I get such advice all the time. For example, if you feel chest pain and loss of consciousness coming on, cough and you can ward off the effects of a cardiac arrest! Here is another example: "For those

who like to drink cold water, this article is applicable to you. It is nice to have a cup of cold drink after a meal. However, the cold water will solidify the oily stuff that you have just consumed. It will slow down the digestion. Once this 'sludge' reacts with the acid, it will break down and be absorbed by the intestine faster than the solid food. It will line the intestine.

"Very soon, this will turn into fats and lead to cancer. It is best to drink hot soup or warm water after a meal."

The internet provides an opportunity for ignorant people to propagate such nonsense (alimentary errors?). It reminds me of that joke – if you give several million monkeys a typewriter and leave them to bash away randomly, one might produce the works of William Shakespeare. Thanks to the internet we know that's not true.

That is the paradox of the internet – it pops up a lot of rubbish but at least you have the means to instantly check anything that has been sent to you. There can be nothing more satisfying than hitting "Reply to all" with a link identifying something as an urban legend.

Cyberchondria

The internet is very useful in the health sector and I often encourage people to use it to check things for themselves. After offering health advice and sensing that I am not believed I often say to people, "You don't have to believe me – check for yourself and you will see I am telling you the truth." As well as just dealing with illness I believe that doctors have a duty of care to educate their patients. Instead of endorsing ACC claims for 'white-tail spider bites' doctors should be telling patients about the Isbister study. Some web-based applications have been shown to be better than doctors in diagnosing the cause of abdominal pain.

Of course the internet can also be a cause of anxiety for people who endlessly trawl websites looking for diseases that they might have. This has been labeled 'cyberchondria' and is typified by an addiction to internet symptom diagnosis.

Poor maligned wee beastie: the white-tail spider

Edward Shorter (From Paralysis to Fatigue: A history of psychosomatic illness in the modern era) predicted that we were entering a psychosomatic era and the internet is perfectly placed to play its part in fostering abnormal illness beliefs such as RSI, GWS, MCS and so on.

Hypochondriasis will always be with us and whatever the damage done via cyberchondria I believe on balance that the internet is a hugely beneficial technology for medicine. I use Google nearly every day to check unusual acronyms, drug doses and current evidence-based treatments.

The cyberchondria article mentioned the dread doctors feel when patients walk into a consulting room with copious web printouts. I seldom experience this but I did once have a mother offer a rare web-based diagnosis for her sick child. She was right! The annoying thing was that the initial presentation was atypical and after the child was discharged from hospital she refused to pay her bill because she claimed the diagnosis ought to have been made at the first consultation.

Vitamin C Quackery

The NZ Family Physician (Vol 35 number 5, October 2008) is now defunct and I for one will not miss it. It had become a hackneyed apologist for quackery and the last issue lived up to this reputation by publishing an infomercial for a quack vitamin C clinic posing as an original scientific paper (**www.rnzcgp.org.nz/nzfp-october-2008/**).

A link soon appeared on the vitamin clinic website (**www.camltd.co.nz**)

The NZFP has been replaced by the Journal of Primary Health Care and I am very pleased to report that the editor is Dr Felicity Goodyear-Smith. The first issue came out in March and contained two good letters strongly condemning the vitamin C article. You can read my letter as well as the others at **www.rnzcgp.org.nz/journal-of-primary-health-care-01/**

Superstitious? Me? That depends

When the Sunday Star-Times decided to survey the nation on how superstitious New Zealanders are and about what, **Vicki Hyde** *got used as a guinea pig. Part One of her responses was published in the last issue of the NZ Skeptic. This is Part Two.*

The Paranormal

Paranormal phenomena are things that cannot be explained and/or proven by current scientific methods. Put a number between 1 and 7 next to each item to indicate how much you agree or disagree with that item.
7 = Strongly agree, 1 = Strongly disagree, 4 = Neutral

- *Astrology is a way to accurately predict the future.*

1 – Having done lots of charts, I know it's applied psychology – people will read into it what they want to. No accuracy, no prediction.

- *Psychokinesis, the movement of objects through psychic powers, does exist.*

7 or 1 – If you'd said mental abilities instead of psychic powers, I would have agreed. We have a growing number of examples of neurological manipulation of an external environment, such as people able to move cursors around a computer screen by thinking at it. That's real with the right kind of technology behind it. And pretty darned amazing, not to mention hugely inspiring for people with motor disabilities, given the possibilities for future development.

However, using psychic powers, a la X-Men, to shift things, that's not been demonstrated.

- *During altered states, such as sleep or trances, the spirit can leave the body.*

1 – Presupposes the existence of the spirit in the first place ...

Out-of-body experiences (OOBEs) are fascinating and real in the sense that the people who experience them – me, for one! – feel as if they are real. However, neuroscience is starting to paint a very interesting picture of how these experiences occur and even how to induce them. This does not involve the spirit departing the body, nor have such experiences been able to demonstrate conclusive proof of knowledge gained solely from such a spirit wandering.

- *The Loch Ness monster of Scotland exists.*

1 – Though it would be great if it did. Imagine a plesiosaur living in these times; that would be a magnificent survival story. But you only have to stop and think for a bit to see how unlikely it is. We've got much more chance for the Fiordland moose or the moa to pop up here than Scotland's favourite cryptozoological beastie lurking in the depths.

- *The number '13' is particularly unlucky or particularly lucky*

1 – Only if you're culturally responsive to it. Other cultures don't like four or seven or NEE!

- *Reincarnation does occur.*

1 – I haven't seen any good evidence for agreeing with this, and it presupposes a whole host of entities and processes to support it for which there is no evidence.

- *There is life on other planets.*

7 – I'd prefer if it you said "likely to be life on other planets", as we still don't have any specific examples, but I'll take a punt and be definite on this one. It's a big universe out there and it would be rather presumptuous of us to assume that our planet was the only one to experience the right conditions for life to occur.

Most card-carrying skeptics would agree with this one. Where we tend to demur is the idea that that life must therefore be intelligent and buzzing our planet teasing the natives ...

- *Some psychics can accurately predict the future.*

1 – Only if you define accurately to mean "roughly right if you let them reinterpret what they said after the event". Anything other than their very generalised predictions have failed

on a regular basis. Here's some examples:

For 2001, psychics predicted that:

- the nine US Supreme Court judges would vanish without a trace
- the Mississippi River would flood, forming a new ocean in the US heartland
- Pope John Paul II would die and his successor would be Italian

And the big story they missed – the 9/11 attack on the Twin Towers in New York.

In 2005, professional psychics saw the usual mix of the banal and bizarre, including that:

- terrorists would start World War III by shooting a nuclear missile into China
- the winner of a new reality TV show would gain fame by killing and eating a contestant
- the San Andreas Fault in California would have a massive rupture on June 17 with a death toll reaching 4,568,304

What did they miss – Hurricane Katrina, which made thousands homeless in the southern US, and the devastating earthquake that hit Pakistan and India in October, killing 73,000 people.

- *There are actual cases of witchcraft.*

5 – It depends on your definition of witchcraft, which is a culturally and historically complex concept. Riding on broomsticks, outside the Harry Potter movies, is right out, though there might be a technological fix for that in the future, which could be fun.

In a strong cultural context, makutu, maleficus, pointing the bone, voodoo and a whole pile of other psychological techniques can certainly affect a compliant individual immersed in the belief system.

Taniwha – a cultural reality, if not a physical one.

- *It is possible to communicate with the dead.*

1 – Certainly not going by the current crop of rather banal, self- similar pronouncements by those professionals claiming to have this ability.

- *Taniwha do exist.*

4 – Culturally yes, physically no. And this makes it different to the Loch Ness Monster or the Yeti, where people claim such things can be found and photographed.

During the 2002 furore over the Waikato taniwha lurking inconveniently in the path of the main south highway no-one went and actually looked for Karu Tahi. It was understood that the taniwha was a cultural matter, not a physical matter, and that regardless of that, it had a role to play in the debate about development.

- *Have you ever had a 'paranormal' experience – one that can't be explained scientifically, or 'proven' in ways that a scientist would accept? If so, what was it?*

Not one that I haven't been able to think of an alternative non-paranormal explanation for.

You've got to remember that, based on general experiences and basic maths, you should experience a million-to-one coincidence roughly every two years – so the world will throw up mysterious experiences from time to time. How we explain those experiences by observation, examination, replication and just plain hard thinking is a lot of fun, and far more interesting than the quick jump to a paranormal pablum.

Lotto

- *How frequently do you buy a Lotto ticket?*

Not in about 10 years.

- *If you buy one often, do you regularly use the same numbers? (Y/N)*

Nope, but I do know what numbers to use to increase my winnings. Send me $10 and I'll tell you how ... :-)

But seriously, you can improve your winnings by doing the following:

- select sequences – most people think these can't come up as they aren't random, but they are as random as another other set of numbers (don't choose 1, 2, 3, 4... or ...37,38,39,40 as these are more likely to be chosen for sequences).

- don't choose any numbers with 7 in them; seven is commonly considered a lucky number, so when the numbers 7,10,17,23,27,33,37 came up in one draw, 21 people shared the first division prize and 80 people took the second division. The average number of winners at that time were 3 and 19 respectively, so any winner of that draw had a much smaller part of the pie.

- don't choose double digits or numbers ending in 0 – these are more likely to be picked by people playing numbers.

These strategies do not affect your chances of winning, but can be used to improve the amount you win. This is because you are not playing merely against the machine, but also against everyone who has a Lotto ticket. Pick the more 'popular' numbers and you'll have to share the prize with more people. Select 'uncommon' numbers or 'unlikely' sequences and you have a good chance of not having to share the winnings.

Who said maths wasn't useful ...

Religion

- *Do you consider yourself to be a religious/spiritual person? (Y/N)*

No. Ethical, yes; moral, yes; honourable yes, but I don't think you have to be religious or spiritual for any of that.

- *If so, what religion/ teachings do you follow?*

I guess the closest I'd get to one would be the Golden Rule, found in many a religion and philosophy – variously described as "do as you would be done by". Sure there are critiques of this ethic of reciprocity, but it's not a bad one-liner to start with.

Conspiracy Theories

Below is a list of theories about the causes of important or controversial events. Please read through, and indicate how likely these are as actual explanations.
7 = very likely, 1 = extremely unlikely

- *The All Blacks were deliberately poisoned before the 1995 rugby world cup final*

5 – Put enough people together in a group environment under stress and it's not unlikely some will fall ill. 'Course the circumstances can seem more suspicious depending on the situation, and I'd tip this one on the more likely side just because of the circumstances surrounding it. On the other hand, sh*t happens ...

- *Princess Diana was killed by British secret service in order to prevent a Royal scandal*

1 – I just don't think they're that competent ...

- *A secret cabal of American and European elite control the election of national leaders, the world economy, and direct the course of history in their favour*

1 – At some times, in some places, there have been powerful non-elected forces at work behind the scenes, but an all-powerful Illuminati seems very unlikely.

- *There is a deliberate political conspiracy to suppress the rights of minorities in NZ*

3 – Not a conspiracy, but possibly just basic human psychology at work. Never put down to malice what can be achieved through thoughtlessness ...

Of course, you could argue that democracy and consensus-building, by their very nature, are going to ride over minorities in their general quest for the greatest good for the greatest number. But I'd need a lot more red wine in me to get into that debate ...

- *NASA faked the first moon landings for publicity*

1 – Only the first?

I think the saddest thing about this one is that my kids, and a whole lot of other people, are growing up in a world where they've never seen a moon shot to inspire them with a sense of awe at what humanity is capable of achieving. When everyone in my fourth form class had a poster of the Bay City Rollers stuck to their desk-lid, I had the famous shot of Buzz Aldrin standing on the Moon. It still makes my heart lift.

• *The war in Iraq has less to do with promoting democracy than it does with controlling oil production in the East*

6 – The reasons for going into Iraq were pretty shonky in the first place. But few things are done for just one reason ...

• *Elvis Presley faked his death to escape the pressures of fame, the shame of his decline, or the unwanted attentions of the Mob*

1 – Nope, he just carked it. Now if you'd cited Jim Morrison I might've wondered as I think he'd have been smart enough to pull it off ...

• *World governments are hiding evidence that the earth has been visited by aliens*

1 – Too big a story, too incompetent a collection to let that one run for any length of time.

• *The American government was either involved in, or knew about, the September 11 attacks before they happened*

2 – I gather they were aware that an attack of some kind was being planned, but the rest of the conspiracy ideas around this are just sickening and demonstrably incorrect in many cases. People want to find an explanation for such things and someone to blame and, for some, governments or Big Business or the MIB or the Gnomes of Zurich serve as the first port of blame.

Evolution book one for the library

Evolution – What the Fossils Say and Why It Matters. Donald R Prothero, Columbia University Press. Reviewed by Louette McInnes.

IF YOUR local library doesn't have this book, go out right now and request they buy a copy. Donald Prothero, is a professor of geology with a specialty in Tertiary mammals. While the book is designed to deal with the fossil evidence for evolution, it does so much more than that.

Prothero presents an entrancing saga of the evolution of life on earth, from the simplest molecules and life forms through to our own arrival as the third chimpanzee. Each chapter is a densely packed yet highly readable chronicle of evolution: the nature of science; the origins of the Biblical account and 'flood geology'; the history of the theory and how Neo-Darwinism gave way before Hox genes and evo-devo; the major stages of evolution on Earth; some well-done examples of the fossils demonstrating the evolution of horses, whales, elephants, birds, and many other animals. The book is reasonably well illustrated, certainly enough for an interested non-biologist to follow. He also deals with cladistics and classification, which I never understood so well before, and how this has changed our view of which animals belong in the same families.

There are some lovely examples of evolution using structures already present to accomplish some function. The panda's thumb is well illustrated, and is well known. The nerves in a giraffe's neck was a new one for me – how the nerve connecting brain and larynx circles back down past the heart, then up again to the head, and how this arose from our fish ancestors and can be followed in the developing embryo – a wonderful example to confound the creationists when they talk about a 'divine watchmaker'! He also has the best x-ray and photo I've ever seen of a genuine human tail.

As well as all this, Prothero fulfils his main aim of dealing with 'creation science' and 'intelligent design' arguments. He does an excellent job of detailing the creationists' shortcomings: not understanding what they are reading; deliberately misleading tactics; 'quote mining' for fragments or sentences that can be used to claim some reputable scientist is denying evolution; using very out of date sources that don't show the latest fossils. Tactics every good skeptic or teacher should know about. I am 100 percent certain that Stephen Gould, to whom the book is dedicated along with Niles Eldredge, would have loved this book if he had lived to see it.

If undelivered, return to:

NZ Skeptics
PO Box 29-492
Christchurch 8540

Sign up for more skeptical discussion!

The NZ Skeptics Yahoo group is a discussion forum moderated by members of NZ Skeptics.

If you go to **groups.yahoo.com/group/nzskeptics/** you will reach the home page of the forum.

To join you can send an email to the subscription email address on the page. Or, if you have a Yahoo ID, you can click on the Join link.