

the skeptic

VOLUME 20, NO 1

AUTUMN, 2000

A journal of fact and opinion

AS OLD AS TIME—Radiometric Dating

**This month's miracle cure—
The quackery in the drugs debate**



SKEPTICS WORLD CONVENTION—SYDNEY 2000

the Skeptic

Vol 20, No 1

ISSN 0726-9897

All correspondence to:
Australian Skeptics Inc
PO Box 268
Roseville NSW 2069 Australia
Tel: (02) 9417 2071
Fax: (02) 9417 7930
e-mail:
skeptics@kasm.com.au

web pages:
Australian Skeptics
www.skeptics.com.au
No Answers in Genesis
www.onthenet.com.au/~stear/
index.htm

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Editor: Barry Williams
Contributing Eds: Tim Mendham
Steve Roberts

Editorial consultants:
Dr Stephen Bassler (medicine)
Dr Richard Gordon (medicine)
Dr William Grey (philosophy)
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Branch correspondents:
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Darwin: Simon Potter
Gold Coast: John Stear
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Tas: Fred Thornett
Vic: Steve Roberts
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Barry Williams
Richard Cadena
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Skeptics around Australia

New South Wales:
Australian Skeptics Inc
PO Box 268
Roseville NSW 2069
Tel: (02) 9417 2071
Fax: (02) 9417 7930
skeptics@kasm.com.au

Hunter Skeptics:
PO Box 166
Waratah NSW 2298
Tel: (02) 4968 9666
Fax: (02) 4952 6442

ACT
Canberra Skeptics:
PO Box 555
Civic Square ACT 2608

Victoria
Australian Skeptics (Vic) Inc:
GPO Box 5166AA
Melbourne VIC 3001
Tel: (03) 9391 9101
Fax: (03) 9391 9101
contact@skeptics.com.au
<http://www.skeptics.com.au>

Queensland
Australian Skeptics (Qld):
PO Box 6454
Fairfield Gardens QLD 4103
Tel: (07) 3255 0499
qskeptic@uq.net.au

Gold Coast Skeptics:
PO Box 8348
GCMC Bundall QLD 4217
Tel: (07) 5527 9884
Fax: (07) 5577 4784
winckle@onthenet.com.au

South Australia
Skeptics SA:
PO Box 377
Rundle Mall SA 5000
Tel: (08) 8272 5881
Fax: (08) 8272 5881
lakes@senet.com.au

Western Australia
WA Skeptics:
PO Box 899
Morley WA 6062
Tel: (08) 9448 8458
wa.skeptics@austraiamail.com

Tasmania
Australian Skeptics in Tasmania Inc:
PO Box 582
North Hobart TAS 7000.
Tel: (03) 6234 1458
thornett@netspace.net.au

Northern Territory
Darwin Skeptics:
PO Box 809
Sanderson NT 0812
Tel: (08) 8932 7552
Fax: (08) 8932 7553
dwnskeptic@ais.net.au

Notice

Third International Skeptics Convention

University of Sydney

November 9-12, 2000

Details page 36-37



Around the traps

Bunyip

Sometimes it's nice to be on the winning side, and it's also a pleasant change to be able to give a pat on the back to the various state and federal governments.

Despite a shrill campaign of misinformation by opponents of vaccination, we are now in the happy position that 96% of our children have been immunised against measles, after being as low as 50% only a couple of years ago.

The NSW Health Dept have released figures that show that September 1999 was the first month since colonial times where no cases were reported. In total, only 32 cases were reported in that state for the year, compared with more than 2000 cases in 1993.

* * *

Does anyone else find it ironic that Christian fundamentalists who loudly condemn homosexuality, relying on quotations from their favoured King James Version of the Bible to support their case, never acknowledge that King James I was himself homosexual?

* * *

As Skeptics we are often confronted with stories that seem so strange as to encourage people to believe that some cosmic entity (malign or benign) is manipulating the world in meaningful ways, but which we would see as being simply coincidental. This is one such story.

In mid-December, a Sydney subscriber contacted us wishing to take out a Gift Subscription to *the Skeptic* for his daughter. We had just instituted special gift subscriptions in which the recipient received, as a bonus, the last issue for 1999 plus four random back issues. We duly posted the magazines to the daughter's address in a Sydney suburb. A few days into the new year, the father rang and said his daughter had not received them, so we sent another set to the same address.

When our mail was collected on Feb 2, the second parcel we had sent to 74 Lamb St (which our data base showed as being the address of the young woman) had been returned, marked "not at this address". We checked the original order and discovered our mistake; her address was 47 Lamb St; a simple case of transposi-

tion of digits, it seemed - but there was more. In the same mail was a form from another subscriber renewing his subscription. His address was 74 Lamb St in the same suburb, and to stretch the coincidence even further, his subscription had been given to him as a gift by his mother (a member of the Vic Skeptics committee).

We blame the New World Order.

* * *

Apropos the above, can it be mere coincidence that in the same week that the *Medical Journal of Australia* reported an increasing number of GPs referring people for alternative therapies, the admirable Library Society (State Library of NSW) advertised a talk entitled "Doctor hanged for professional negligence"?

Or could coincidence account for the fact that at the same time that Sally Loane (ABC Radio 2BL), referring to the above mentioned *MJA* report, was talking to a Dr Hindmarsh about it, we were entering a renewal for a subscriber named Hindmarsh?

Then there was the day a couple of years ago when we received two new subscriptions from people living in Orange. Both had the given name Scott and both had family names that referred to skilled trades (Carpenter and Goldsmith). In the same week we also received two more subscriptions from men named Scott, and they had the same family name (King). We have noticed many similar coincidences as we carry out *the Skeptic's* business.

Coincidences can be (and often are) seductively persuasive and it is not too difficult to see why many people are convinced that they point to some underlying purpose or order, but as the above trivial examples reveal, our brains impose this belief on the universe, and not the reverse.

* * *

We often manage to get a chuckle from *Prayer News*, the creationist tabloid produced by AiG, and the Feb 2000 issue did not let us down.

"Dawkins brought me out of atheism" screamed one headline, the story being that someone who reviewed Richard Dawkins' *Blind Watchmaker* on the Amazon 'net bookshop claimed

that reading the book took him away from atheism and back to God. A coup for the terminally deluded, you might think, but if so you should check the Amazon site for yourself.

Anyone can write a review of any book on Amazon and *Watchmaker* had attracted 95 at time of writing. Initially they are generally complimentary, with a few thoughtful points of disagreement from those whose sincere beliefs might be offended.

Then the tone changes and there follows a raft of antipathetic (and pathetic) "reviews" from people who tend to sign themselves "a reader". Problem is, these negative reviews are all written in the same tones of pious cant and ignorance of scientific basics that the dedicated creationist watcher soon learns is the staple literary style of this unhappy breed.

This sort of organised write-/phone-in campaign has been tried by political parties during election campaigns, and canny editors, who can spot a stooge at 1000 metres, give them short shrift.

Literacy (or the lack thereof) is as distinctive a measure of the intellectual differential that exists between genuine seekers after truth and creationists as are the ignorant and blatant misrepresentations of science by the latter.

* * *

The same issue contained a flier for a Summer "Super-Camp" being held in Jan 2001, in which lucky people can sign up for a week of fun and propaganda in the Blue Mountains. It will be addressed by the usual sad team of creation apologists. It was interesting only for two items, one which described AiG's in-house industrial chemist as "one of the strongest creationist minds in the world" (Talk about damning with faint praise - probably means he has his own crayon.) and another which revealed that one of the guest speakers is a psychiatrist. At least *she'll* have plenty of raw material on whom to hone her skills.

* * *

Is it becoming apparent to anyone else that the acronym ABC, as used by the national broadcaster, stands for Another Bloody Cook?



How to become an astrologer

Steve Roberts

There was a major conference of astrologers at La Trobe University in mid-January; five of us went along for a sticky beak. This three-day weekend conference was about the same size as the recent SA Skeptics conference, but with guest speakers from the USA and Europe. Actually it spread over four days, since for astrological reasons the conference had to be opened at exactly 12:10pm on the Thursday, which left the delegates with nothing much to do for the rest of the afternoon. The star chart for this moment was given in the delegates' programme, so they could stick their pins into it or whatever. (Wow! I have just invented astrological acupuncture.)

The only lecture of interest to Skeptics was the keynote address on "why people feel the need to predict the end of the world", for which I tried to order an audio tape, but the lady at the registration was determined not to serve me. Another talk explained how the *Titanic* disaster might have been averted through a more detailed study of the ruling planets. The possible uses of a study of icebergs were not mentioned.

In the concourse, several commercial stands had been set up to sell books and software. A typical astrological PC application retails for \$340 - you bang in a client's name and date of birth, and the program then generates all the astrological charts and a whole swag of fuzzy predictions, as formatted text ready for printing and binding. The only use of this software is through commercial exploitation. Get yourself an astrological diploma for another \$400, and away you go - a fully modernised, computerised 21st-century astrologer. Remember

to be rude to Skeptics. This concludes my article; thank you for reading.

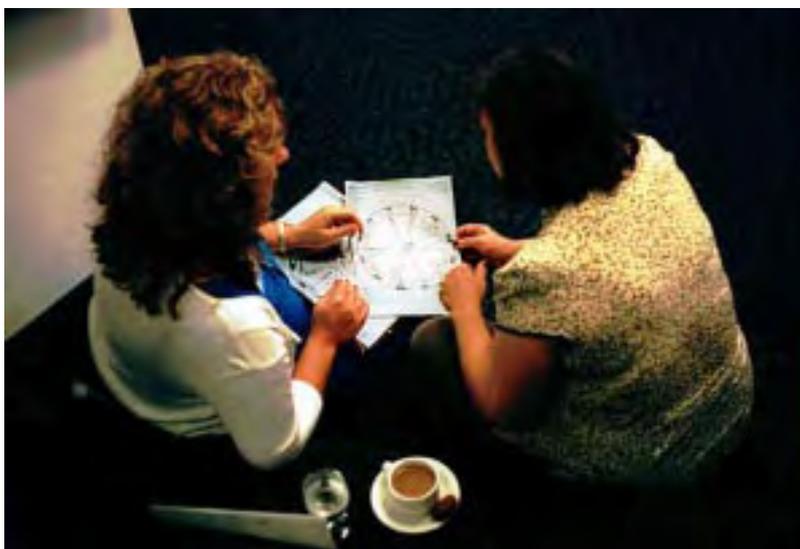
However I do have some more details about the conference. To a Skeptic, its highlight was the bookstalls in the concourse, some of which offered hundreds of different books for sale. Here you could see all (well, some) of the different types of astrology, on display at once. The books that told how to predict the stock market using astrology cost much more than the others, which demonstrates that you *can* make money this way. Some quite big books dealt only with Pluto, including how to counsel rape victims in the light of its effects (though presumably not by the light of the planet, which is invisible to the naked eye). Many books were about Chiron - to astronomers, Chiron is an even more obscure lump of rock orbiting between Jupiter and Saturn, but to astrologers it's a whole new planet of major significance betokening new sorts



The author, aghast at having just read the prophecies of doom presaged by minor planet 5007 Keay.

of gloom, doom and anguish. Books of tables gave the positions of all the planets and asteroids, including poor Colin Keay's.

Those were the books on just astrology, but the whole spectrum of New Age mumbo-jumbo was also linked



"Oooh look, Saturn's in Pisces so it should be safe to drink the coffee, but with Chiron entering Ophiuchus I think I'll leave the wombat turd."

in, with astrology and reincarnation, astrology and Feng Shui, astrology and Bach flower essences, astrology and Reiki healing, using astrology to develop your child's full potential ... the possibilities seemed endless. One book featured a foreword by the late Diana, Princess of Wales, whose astrologers should have advised "don't drive too fast" - along with any astrologers advising the captain of the *Titanic*. A bewildered

Bob Nixon asked “So many books – don’t they contradict each other?” and was told “Well, isn’t life contradictory?”*

One stall was selling oracle books and cards. You take two cards at random, giving you a star sign and a number. I did so and thus cast myself forever as a Capricorn 02, which was looked up in the oracle book to inform me that I was a comedian. I was told that

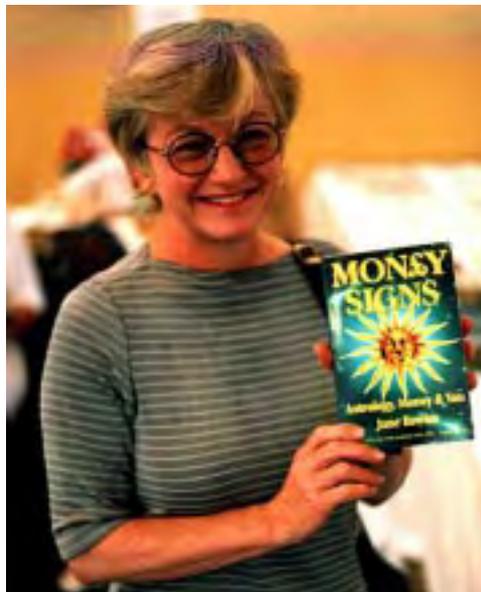
the entries in the book were definitely valid, because somebody had dreamed of them in 1925. I didn’t like this result so I asked if I could use my real star sign, or take two more cards and try again. But no - I am stuck with the name of a possible movie sequel, and doomed to tell jokes forever, like a more cheerful version of the Wandering Jew or the Flying Dutchman. I can, however, get the time of my birth “adjusted” using Hindu principles, for \$30. Now that is really something useful - I have never liked being a *Faeces* (Aug 14 – Aug 17).

At one point one of the other Skeptics wondered aloud “What is Cosmobiology?” and I began to explain about the work of Michel Gauquelin. A nearby astrologer overheard and interrupted “No, no, no - cosmobiology relates to the work of Ebertin and others”.

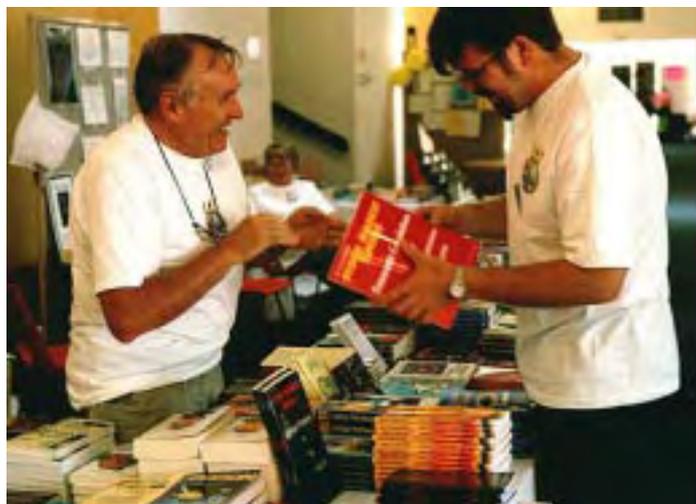
Whereas Gauquelin’s correlations, now discredited and irreproducible, dealt with positions of planets relative to the horizon, Ebertin’s style is more obsessed with planets 90° apart from each other along the ecliptic. This is contrary to most other astrologers, who like 60° and 30°, except for those who like 45° ... and you can allow for a margin of 5-7° either side. Imagine



Skeptics trying to read ... eventually one of them gets the book open



Vic Skeptics Treasurer and bard, Rosemary Sceats, gets some solid financial advice.



“How silly - it says here that all Scorpios are going to be wearing the same shirt today.”

my depression at being born with two planets exactly 37.5 degrees apart ...

Anyway, you can still use either of these cosmobiological techniques to make predictions, about as accurately as any other astrological technique.

The same astrologer said that although astrology was not properly studied yet because computers had only recently been invented, she (sorry, it’s usually ‘she’)

was sure that it worked because she had applied it to horse racing. If a race starts off when Mars is in an important position, it will always be won by a Mars horse. How can you tell that a horse is a Mars horse? Surprisingly, not from the time the horse was born, which ought to be easy**. Instead, you sort of acquire a distinct feeling that it *is* a Mars horse. Especially if it’s called Red Warrior etc, but even more especially by its winning a Mars horse race.

Well then, having identified it as a Mars horse, can you follow it in future races and make limitless amounts of money? The astrologer had not got this quite right yet and was continuing with her job for now. What job? She teaches mathematics and science. Can somebody

run those end of the world predictions past me again, please?

Footnotes

* And indeed, some people do think so, but I disagree.

** However, officialdom has decreed that all racehorses have the same birthday. Thus, astrologically speaking, most horse races should be very dull, slow-moving affairs, whereas in the remaining few races a wild stampede of animals would all break the track record as they plunge simultaneously over the finish line.



The quest for the Golden Wand

Bob Nixon

John Stamos is a Melbourne inventor who claims to have come up with the perfect tool to find gold. Dubbed the "Golden Wand" by Mr Stamos, the device consists of four aluminium rods filled with a secret concoction of minerals.

The rods are operated by two people, who stand face to face and link the rods in their hands with the rods in their colleague's hands using the notch cut into the end. After a few seconds the rods move at the joint, pointing towards the nearest, or largest, lump of gold. Mr Stamos has been working on his rods for seven years, refining the secret ingredients and experimenting with their operation. In the process of marketing his rods he has appeared in the Melbourne *Truth*, a newspaper once renowned for never letting the facts get in the way of a good story.

Mr Stamos contacted the Skeptics to inquire about the challenge and I met with him at his home. John and his wife demonstrated the rods and it quickly became clear to me that this was a paranormal claim. The rods are powered entirely by human hands alone. My first assumption was that this was divining, and to some degree it is. Certainly John uses the same sort of explanations that one would expect to hear from a diviner. Certainly the test that the challenge team devised was similar to one that we might use for a diviner. For his part John is adamant that this was not divining. He is an inventor, and we would test his invention, not a power he claimed to possess.

The first test was conducted under watchful gaze of a camera from the television show *A Current Affair*. It involved placing a target, a ring and a small amount of gold dust, inside one of four shoeboxes and having John and his wife find it. There was no money riding on this test. It was a preliminary test to see whether there was anything in the claim. The principle reason for this was the presence of the television camera, which naturally needed to see everything that went on. Any formal test for the challenge must take the form of a double blind experiment and one important principle of such a process is that no one should know the success rate until the test is complete.

As it turned out we were lucky to have the camera present, because had we been forced to conduct twenty passes we would have been going about five hours. As it was we stopped the test after eight passes and two hours, John had achieved a success rate of one from the eight passes. Having missed seven, John could no longer

achieve the required success rate of fourteen correct from the twenty passes and the cameraman whispered this revelation. We then tallied the results so far and announced to John that he could not succeed. There was some discussion, and a couple of additional passes to see what the problem might be. John claimed that he was receiving interference from box number 4, so we moved that box to another location. The very next pass led to a success, which John took to mean something although this still only meant a success rate of two from eight. He missed in a ninth pass and we called it quits.

Taking part as an observer of this test was Ray Crossley, the Vice President of the Dowsing Society of Victoria, an organisation of which I am also a member. I had discussed John's invention with Ray and knew his feelings on the subject, so was happy to pass his name on to *A Current Affair* when they asked if I knew any diviners. Ray took the view that John was misusing dowsing, a subject dear to Ray's heart and

something he knows a bit about.

I found it more than a little significant that on this occasion we had a hard core Skeptic and a hard core diviner making similar statements about a subject. Ray stated that if you pay more for this sort of device than the cost of a wire coat hanger, you're being ripped off. John had previously sold six sets of rods for \$495 each, although when the television cameras were turned on the price dropped to \$280. My view was that John honestly believed that his rods worked, but that the results of the test proved they simply don't.

My feeling that John believed in his product was reinforced when he contacted me again, saying that he had done further tests and found that the rods could be made to work under controlled conditions. I offered to return and put the rods through their paces a second time, and we duly met in John's garden. John had asked



"Astrology Conference? Nowhere around here". Bob Nixon, photographed on a recent excursion, exhibiting the denial reflex and stance of a typical *Pinguinus* (Feb 29 - Mar 13)

Continued p 10...

The Benalla dowsing challenge

Rosemary Sceats

On Sunday 24 October 1999 yet another attempt was made by a water diviner to claim the \$100,000 prize for demonstrating possession of a paranormal or psychic ability. The challenger this time was a 76-year old Benalla man named Keith Levy, who is something of a local hero in his own district. Apart from his “legendary” dowsing ability, his other claim to local hero status is his ability to find unmarked graves using his dowsing rods. The mere fact that he claims to have detected the presence of human skeletal remains underground is sufficient for the believers. Since it is too expensive to actually dig down to find the bones of the alleged deceased persons, especially since Keith is unable to indicate the depth at which the bones are supposedly buried, the claims of finding human remains are never verified. Keith Levy’s word is good enough for the locals, it would appear!

The test was held at the Benalla Showground, with an audience of approximately 150 people, consisting mainly of local people, but also including some local media representatives. Issues addressed in pre-test discussions included the placement of the test set-up, the distance it should be from the audience, arrangements for hiding the water source and the roles to be played by the various members of the Skeptics Challenge team and Keith’s “friend”, who would oversee the proceedings and ensure that Keith’s interests were not infringed or compromised in any way. The Umpire and I were responsible for shielding the test set-up from view during placement of the target by covering it with a large tarpaulin.

The Umpire for the day’s proceedings was suggested by Keith himself, and happened to be the local Benalla Shire Mayor. It came to light on the day that the Mayor was himself an experienced dowser of long standing, this fact only emerging when the Mayor produced from his pocket a well-used pair of dowsing rods.

The set-up for the Benalla challenge was similar to that used in conjunction with previous attempts to claim the \$100,000. The water source, contained in a length of PVC pipe sealed at both ends, was placed underneath one of four compartments marked on the lid of a long wooden box with a removable cover. The placement was determined by the throw of a die. When rolling the die, the Challenge team found that 3’s and 1’s came up surprisingly often, and for what seemed like a long period early on, these numbers alternated.

Keith arrived with his own pipe and asked if we would agree to his using that for the test. Bob Nixon (Chief Investigator, Australian Skeptics) opened it and tasted the water, finding that it was horribly salty. In order to ensure that it was an ordinary pipe with, for example, no magnetic or other type of device hidden inside it, Bob emptied the water out, but only after verifying with Keith that this was acceptable to him. Steve Colebrook (Victorian Skeptics President), Belinda

Timmins (Victorian Challenge Master/Mistress) and Bob examined the pipe and decided that there was nothing unusual about it. Bob then filled the pipe with ordinary tap water and informed Keith of this fact.

As Keith had raised concerns earlier about being able to detect water in a sealed container, Belinda had brought along a large, unsealed one with baffles so that the water would not spill. Keith rejected this out of hand without explanation.

Keith has since raised an objection to the use of fresh water as the target, but he knew about this at the time and raised no objection then. This is a typical example of the sort of excuse that many failed challengers offer after the event. When asked in the pub after the conclusion of the test why he thought he hadn’t been successful, Keith suggested that it may have been due to interference from magnetic fields in the box!

The technique used by Keith Levy in attempting to locate the water source was interesting in several respects. He used five different sets of dowsing implements, rather than just one, as is usually the case. These were:

- A single L-shaped metal rod, always used for the first pass, held in his right hand, and with an empty, open-sided length of PVC pipe in his left hand.
- A pair of rods, very used and rather misshapen, belonging to the Benalla Mayor/Umpire, slightly curved and larger than usual.
- A U-shaped rod, with sharp right-angled corners.

Before a reaction was obtained, this instrument often required several passes over the compartment chosen as the first selection. Once Keith got some horizontal movement, he was happy. It appeared that it was more difficult to get movement out of this “rod” than out of the standard L-shaped rods. It seemed to be a more stable implement, not as easily induced to move by a slight unconscious muscular twitch. In contrast, once movement had been set in train with the single L-shaped rod, this movement seemed easily and spectacularly amplified.

- A single long brass rod with a curl about two-thirds of the way along, and a small bend at the far end.

This produced quite vigorous vertical vibration which, from where I was standing, seemed obviously induced by Keith. However I was unable to get a really good look at his movements, because he had his back to me at the time.

- A forked, whittled and smoothed willow branch.

This produced spectacular, forceful downward movements, unwaveringly “confirming” even the wrong selections!

One very noticeable fact was that Keith never deviated from his first choice of location, selected with his trusty single L-shaped rod in his right hand, and the open-sided PVC pipe in his left hand.

Another interesting observation was that Keith needed to remind himself of his first selection throughout his successive passes with the remaining four sets of divining implements. He did this by placing a small plywood block on the lid of the compartment chosen as the location of the water source. His rationale for doing this was that as he was getting on in years, his memory could not be relied on. The obvious question to be asked was that if the mechanical responses from the dowsing tools were spontaneous, unambiguous and reliable, why did they not all indicate the true location of the water source, independently of each other and of Keith's recollection of the result of the first pass?

The test was over, unbeknownst to the audience (but known to me and the Umpire) after the first three trials. To win the \$100,000, Keith had to achieve a score of 13 correct identifications out of a total of 15 trials. The first two selections were only one box compartment out, the third selection was two out, and the next two choices were correct. At this point, Keith seemed to have "warmed up", apparently having got his technique "down pat". At least this was the way the Umpire interpreted the situation. However it was also at this point that Keith called for a break, and when he resumed the trials after the break, his technique, which had seemed to be improving, had lost its momentum.

For a properly conducted double-blind test, neither the Umpire nor I should have been aware of the location of the target. It was feasible that as we watched Keith attempting to identify the location of the water source, our body language could have inadvertently given him some visual clues, had we known where it was. During the break after the first five trials, Belinda impressed on both of us the need to look the other way while the pipe was being hidden. However the Umpire obstinately insisted on his right to a full view of the test proceedings at all times, and periodically commented to me about what he saw. He also protested to Belinda that if he couldn't look at where the pipe was being placed and then be aware of this as he watched Keith's attempts to locate it, he would be too bored. (Keith certainly did take an inordinately long time over each trial.)

The final score for the day's test was 5 out of 15, the best score ever achieved in a test of this nature, but still way short of the 13 correct responses required to beat million-to-one odds for this particular test procedure.

When the trials were over, Bob Nixon announced to the audience that Keith had achieved the best score we'd ever seen in a Skeptics' test of dowsing ability. His intention in doing this was to point out how poorly most of our punters have scored during the Challenge's long history, but the irony of the situation was lost on the assembled adoring throng, who broke into spontaneous applause at the news that their local boy was the greatest!



...Golden Wand from p 8

a neighbour to join us, a friendly and somewhat bewildered man called Nick, who was seeing the rods and a test procedure for the very first time. If the first test had been informal, this one was to be positively casual. We used three coffee cups to hide the target, a gold bracelet. I hid the target out of sight from John and Nick and they then attempted to find it. At the end of each pass one of the pair lifted the cup they had selected and I kept a running scoresheet in my head. We made nine passes, and John's rods selected the correct cup three times, exactly what chance would expect.

I had watched the process closely this time, much more closely than when surrounded by a television crew, and I was able to see John's hands moving forward. Someone, of course, had to move their hands forward in order to make the rods bend, but it took some explaining to get John to see this obvious fact. I was also able to see that John let the rods make the initial decision for him, but from that point forward the decision did not change, even on the occasions when the rods refused to confirm the choice. In those cases John would simply continue to search until he found himself back on track. Both of these revelations were a surprise to John.

John then asked a question that set me back a little. He asked why his rods had found the correct place three times if, as I said, they did not work. I did my best to explain the law of averages to him, but in the end suggested that he hide the target and I simply guess where it was. We did this nine times, with both Nick and myself making our independent guesses. Nick was right three times, while I managed a score of six from the nine attempts! As far as I know this is the best score ever achieved by anyone in a similar test.

What I didn't tell John, of course, was that I had taken note of the position of the three cups at the end of each pass. John had made the mistake of picking up only the cup containing the target and the one that was in the position he wanted the target to be. For every pass but the first one I therefore had sufficient clues to allow me to form an educated guess. If the target had been on the right hand side, for example, and then I saw that the middle and right cups appeared differently, I could be reasonably sure that the target was now in the middle. Of course, my score indicates that it didn't always work, but it's a lesson. In my test of John I had picked up all three cups, removed the target completely and then placed it in one of the cups before putting them onto the ground again.

The real surprise came as we discussed the test results. John mused that he couldn't think what was wrong with the rods, and suggested that he would have to do further experiments to determine if he had got the contents right. I suggested that the first question he should ask was, did the rods work at all? I have little doubt that John will conduct further experiments and he will convince himself all over again that his invention works, but for the moment at least John seems to be entertaining the idea that he has been wrong for many years.



Margaret Mead's *Coming of Age in Samoa* and Boasian culturalism

Derek Freeman

In my book *The Fateful Hoaxing of Margaret Mead* (1998) there is an account, based on the sworn testimony of Fa'apua'a, of how Margaret Mead in March of 1926 on the island of Ofu in American Samoa was hoaxed about the sexual mores of the Samoans by her two Samoan traveling companions, Fa'apua'a and Fofoa.

I write to inform Australian Skeptics of the discovery of direct evidence, from Mead's own papers, that Margaret Mead was indeed taken in by the "whispered confidences" (as she called them) of Fa'apua'a and Fofoa. This incontrovertible historical evidence finally brings to closure the long-running controversy over Margaret Mead's Samoan fieldwork. The case is of particular interest in that Franz Boas, who wrote the glowing Foreword to Mead's *Coming of Age in Samoa*, and Margaret Mead herself, both became Presidents of the American Association for the Advancement of Science, Boas in 1931, and Mead in 1976. The implications for anthropology are foundational.

The crucially important direct evidence in question is contained in a little known book entitled *All True! The Record of Actual Adventures That Have Happened To Ten Women of Today* that was published in New York in 1931 by Brewer, Warren and Putnam. The "adventure" by Dr Margaret Mead is entitled "Life as a Samoan Girl". It begins with a wistful reference to "the group of reverend scientists" who in 1925 sent her to study (Mead, 1925) "the problem of which phenomena of adolescence are culturally and which physiologically determined" among the adolescent girls of Samoa, with "no very clear idea" of how she was "to do this." It ends with an account of her journey to the islands of Ofu and Olosega in March of 1926 with the "two Samoan girls," as she calls them, Fa'apua'a and Fofoa. In fact, Fa'apua'a and Fofoa were both twenty-four years of age and slightly older than Dr Mead herself. Dr Mead continues her account of her visit to the islands of Ofu and Olosega with Fa'apua'a and Fofoa by stating: "In all things I had behaved as a Samoan, for only so, only by losing my identity, as far as possible, had I been able to become acquainted with the Samoan girls receive their whispered confidences and learn at the same time the answer to the scientists' questions."

This account, by Mead herself, is fully confirmed by the sworn testimony of Fa'apua'a (cf. Freeman, 1998, Chapter 11). It can be found on p.141 of the second and paperback edition (1999) of my book *The Fateful Hoaxing of Margaret Mead: A historical analysis of her Samoan research*. It is definitive historical evidence that establishes that Martin Orans is in outright error in asserting (1996:92) that it is "demonstrably false that Mead was taken in by Fa'apua'a and Fofoa." It is also evidence that establishes that *Coming of Age in Samoa*, far from being a "scientific classic" (as Mead herself supposed)

is, in certain vitally significant respects (as in its dream-like second chapter), a work of anthropological fiction.

In 1928, in Chapter 13 of *Coming of Age in Samoa*, Dr Mead concluded, unreservedly, that the phenomena of adolescence are due not to physiology but to the "social environment." This extreme environmentalist conclusion was very much to the liking of Franz Boas, "the father of American anthropology" who was both the sponsor and the supervisor of Mead's Samoan researches. In 1934, in the *Encyclopedia of the Social Sciences* (13:34) Boas asserted that "the genetic elements which may determine personality" are "altogether irrelevant as compared with the powerful influence of the cultural environment" (emphasis added). This is a succinct statement of the Boasian culturalism that "from the late 1920s" became, in the words of George Stocking (1973: 86) "fundamental to all American social science."

In Samoa, Mead had acted as Boas's agent and, having been given Boas's enthusiastic commendation, *Coming of Age in Samoa* became one of the most influential texts of the 20th century. We now know from detailed historical research that the extreme environmentalist conclusion to which Dr Mead came in *Coming of Age in Samoa* is based on evidence that is quite unacceptable scientifically. Furthermore, in the light of present day knowledge (cf. Ridley, 1999), this also applies to Boasian culturalism which at the beginning of the 21st century has become a scientifically unacceptable belief system.

This liberating change in the *Zeitgeist* of the late 20th and early 21st centuries is evident in the fact that the Intercollegiate Studies Institute of Wilmington, Delaware, in listing the 50 worst and best books of the century has adjudged Margaret Mead's *Coming of Age in Samoa*, with its approving Foreword by Franz Boas, to be the "very worst" book of the 20th century.

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Clairvoyant revisited

John Paterson

The advertisement in a January 1999 edition of the Melbourne *Sunday Age's* television magazine blared: "MARIA DUVAL, the greatest clairvoyant in the world." She was "offering you a genuine talisman which could totally change your life." And it apparently wouldn't cost a cent!

I'd never heard of Maria Duval before, but the advertisement provided some information. It quotes the *Guide to Astrologers (France)*:

The French press often calls her the 'human radar'. She is the President of the French Parapsychological Research Institute, a distinguished lecturer and member of the Free Faculty of Astrology, and a medium for the Society of Psychic and Parapsychic Studies.

Wealthy industrialists, artists, writers and politicians often call on her personally. One of the biggest French banks consults her when recruiting managers, and the Supreme Pontiff, Pope John Paul II, received her at the 1st world-wide scientific and religious Congress held at the Vatican University of Parapsychology, run by Father Andreas Resch.

There was a photograph showing a smiling, blonde woman in her late forties wearing a pendant, presumably the talisman. There were also testimonials from people in France, Hungary and the Czech Republic attesting to Madame Duval's precognitive abilities and the talisman's abilities to bring luck, health and wealth.

Famous Maria told us that "I'm tired of seeing that some people always get what they want out of life ... while others are plagued by misfortune every single day". That's why she was offering her famous magnetised talisman, to bring luck, wealth and extraordinary influence to the first five hundred respondents in the next fifteen days.

If we felt sceptical (note: not skeptical) about the talisman's effects we were invited to carry it around and watch the scepticism turn to astonishment as our whole lives changed daily. We'd be amazed at how quickly our problems would 'miraculously' disappear, one after another. We would notice this process within 48 hours. Yes, even in this short time-frame there would be an observable difference. It sounds very, very good.

All the reader had to do was simply fill in the form and mail it to Maria care of Database Consultants, a company operating in trendy South Yarra. The reader had to use the actual advertisement; responses made on photocopies of the form would not be accepted.

But wait, there's more! If the coupon was returned within five days Maria would send a free six page personal prediction of the future, answering the questions we ask ourselves about how to solve our problems.

Now all this seemed too good to be true, perhaps even a bit dodgy. What was going on?

Firstly I consulted some experts. I talked to an experienced marketer whose view was that the advertisement looked like something being used to generate a direct mailing database. And I spoke to Bob Nixon, debunker extraordinaire. His view was that respondents would receive some generalised stuff with little personalised material along with a suggestion to spend some money for a highly specialised reading. "I've gotta eat too", would be the justification.

All that remained was to put the predictions to the test. Ideally for a full test there would need to be multiple responses for each of the twelve astrological periods; thirty-six would be a nice number. Here the conditions of the advertisements were adverse: thirty-six punters at thirty-six different addresses, all with the original advertisement, were needed. It was almost as if Maria Duval has had Skeptics bombarding her with photocopied forms before.

As it happened, with the help of various Skeptics, and a mate working at *The Age*, we got ten. Now as well as the usual contact details Maria had some extra questions:

- Did we think we were misunderstood by those around us?
- Did we think we were appreciated for who we are?
- Were we in urgent need of money? (*Who isn't?*) Tick \$1000, \$5000, \$10000 or enter your own amount.



Maria Duval

- Did we think we might have been born under an unlucky star?
- Have we heard of people who have a 6th sense?
- Did we think we might have a 6th sense?
- Did we believe somebody might have put a curse on us?

These questions all sounded like something a fortune teller might ask. They were answered reasonably randomly, but all responses were made to be in urgent need of money, between \$1000 to \$20000. Somebody who had all the money they need didn't seem to be the sort of person who would respond to this sort of advertisement.

Birth dates were required, so the respondents were given varying ages but the actual dates were split into three bands: mid-July, mid-November and early December. The reasoning here was that a genuine astrologer/

clairvoyant would take note of the varying ages in years as well as the month and day. A fake would just use the month and day.

As an extra test two of the respondents were entirely fictitious. Again, a genuine clairvoyant should be able to spot the fakes. And my thanks go to all the real people who allowed the use their name and letterboxes for data collection. Presumably they're enjoying their extra junk mail.

This all took a while to organise so we were well over the five day limit for the free prediction, but we went ahead anyway. In the meanwhile, while waiting for Maria to do her thing, there was an opportunity to see what the Internet had to offer on the subject.

Well, for somebody so famous the Internet did not have much on Maria Duval. I tried a number of search engines and came up with precious little, but what was there made for interesting reading.

America's Better Business Bureau had issued a Consumer Alert entitled "BBB Warns of Questionable Clairvoyant"¹, it was concerned with the National Parapsychology Center/Astrological Society of America and Maria Duval. Consumers across 30 states had complained to the BBB. It appears Maria had similar advertisements to ours running in the USA. Punters would respond and then receive an invitation to spend from \$27 - \$70, and asked to send in some hair or a photo, in order to get further details.

Another site² with the title "Physic Fraud" referred back to the BBB site and made it's own analysis of Maria's *modus operandi*.

Britain's Advertising Standards Authority had details of an adjudication against Maria and Astroforce Ltd on another site³. The complaint was about advertising that sounded very similar to that in the *Sunday Age* television guide. The complainant had questioned if the prediction was personalised as claimed. The ASA upheld the complaint and asked the advertisers to avoid giving the impression in future that the predictions were individually personalised.

There was another site⁴ that essentially pointed back to the previously mentioned material, as well as providing a number of links to sites run by various Scandinavian Skeptics. Bob's predictions were looking good, based on international experience.

Then I hit paydirt, finding a British Astroforce site⁵ offering access to mailing list of 400,000 people. The profile was given as:

This is a list of mail order responders who don't want to leave their luck to chance. They have all responded to advertisements in the national press from Maria Duval the 'Human Radar'. Responders to the advertisement are sent a magnetised talisman and a 6 page horoscope to help them improve their luck. The file is 70% female and 30% male ... 40% of responders go on to purchase a variety of Maria Duval products."

The names had been collected in 1996/97, and mailing list buyers could make their selections based on: geography, gender, date of birth, media source and whether or not they'd actually bought anything.

It was beginning to look like my marketing consultant's prediction was a sure bet too.

Maria wrote back to our 'responders' with a six page letter dated March 11, which didn't actually arrive until late March. The letter was obviously printed, but in a "hand-written" font. It noted that the responders with July birth dates were Cancerians, November birth dates were Scorpios and December birth dates were Sagittarians. There were no surprises there. (Mind you all the birth dates provided, except for my own were fictitious, which surely would have been spotted.) We're all told what day of the week we were born on and then given a paragraph of 'personal detail'.

Here's mine:

Jupiter reigns over the planetary evolution of your chart. This solid, stable planet is preparing to lend you some of its quiet strength to confront and eradicate the difficulties which are annoying you. Be guided by this planet and try to tune in your thoughts so that you can communicate more effectively. The leads which spring to mind will then turn out to be profitable and productive. Don't let yourself become distracted because this process is important to your future."

So much for the six page personalised prediction. Funny enough, nobody else got

any more detail than I did. Scorpios were all going be guided by the impressive strength of Pluto. And Cancerians were all told that the moon was winking at them, to show that it was watching over them! And we were all going to enter a period of good fortune, particularly now that we had the famous Psychic Talisman. It was going to act as a link between ourselves, the spirits and the cosmic forces.

The magnetic talisman was just a piece of glossy card with Maria's photo on one side and some runes drawn within circles on the other. I could detect no special magnetic properties, and I defy anyone else to for that matter.

The letter also contained a potted history of the talisman and its luck inducing abilities, but ultimately most of the letter was an attempt to get you to spend money. Just fill in another questionnaire so that Maria could send her Personal Prediction, a personal Natal Study and a calendar of Lucky Numbers. This would normally be very expensive, but Maria was offering them at a discount price of \$79.95 plus \$5.50 postage and handling. Three free gifts were also available: details about their personal angel, a special test to try out their own psychic powers, and a set of 22 major arcana cards. The questionnaire required more precise details about the timing and location of one's birth, along with more fortune teller type questions.

Included in the envelope was an article entitled



European publications purporting to trumpet Duval's virtues

"Who is Maria Duval?" by Frank Lancel, which gave some extra detail of her alleged psychic triumphs and abilities, along with some extra testimonials from happy punters. And there were various newspaper/magazine clippings from European publications all showing Maria hard at work and all espousing her psychic gifts.

So the first mailing from Maria Duval was pretty much as predicted: some general guff along with a plea to spend money. By the end of the letter the tone was fairly urgent: "don't hesitate, reply today", relying on some fairly straightforward marketing principles – people who delay in responding are more likely to not respond at all. Well I responded, but being the stinger I am, I only went for the freebies.

At this point contacting the Department of Consumer Affairs seemed a good idea. Unfortunately they weren't interested at all. In the last telephone conversation I had with them, the Consumer Affairs official suggested, in quite patronising tones, that since I hadn't actually spent any money I didn't actually have a valid complaint, and I should stop bothering them. Apparently one needs to be gullible enough to have lost money before Consumer Affairs take action. It would seem something being dodgy is no longer enough for them to act in the public interest.

In the meanwhile more material and offers kept rolling in. To date there have been about a dozen. In all of the offers the tone is warm and friendly. We're among a privileged few to be receiving the offer. She's deeply concerned for our luck, wealth and general well-being, so much so she's most anxious to help. The tone is always one of urgency: act now, don't delay, time is of the essence. And she's convinced that the lives we're leading are not what they could be. There are secrets involved; Maria and we are working in partnership for a very positive outcome. There are negative waves everywhere, so we should be watching out – bother! And there is always a free gift for the punter who buys.

Usually my birth date was on the response form just so I know she's got my details right. (Actually my birth date was the only real one supplied. Surely my mother must have known that Pearl Harbour was a rotten omen and should have held on for another day!)

Giving all the details of the offers would take far too long and leave readers bored stupid or laughing senselessly, so here are the highlights.

There was the first offer of a personal prediction, natal study (was that pre or post?) and a calendar of lucky numbers which came my way with alleged six pages of personal prediction.

Next came an offer to receive an authentic "Dynamic" crystal, which was apparently millions of years old. Its powers would help me to: gain promotion at work, win the affection of the person I love, attract money, influence others both physically and mentally and realise my dreams. It was free so of course I went for it! But I didn't order the instruction book to get the crystal working.

The crystal arrived six weeks later. It was nothing amazing. I've now got two now so presumably I'm extra lucky. There was also a further suggestion that I buy the *Personal Guide to Programming the Dynamic Crystal*. Maria was greatly concerned I hadn't already

ordered it. It might also explain the terse letter I received much later dated May 6 thanking me for placing an order but not pre-paying for it, and asking for my credit card details. Since I knew I hadn't placed an order, and as there was no indication what the order was supposed to have been for there was no way I was going to fill in that form. Nothing more was heard on this one.

The Automatic Money Trigger was going to make me very rich. My luck would increase, so presumably I was going to venture inside a casino to acquire this wealth. The letter gives no indication of what one actually looks like, but my guess is that it looks like a piece of glossy card board with funny scribbles all over it, with perhaps Maria's smiling photo on the obverse side.

The Luck Harmonizer (sic), Wish Releaser was going to act as a 'hyphen' between Maria and me, some sort of Aladdin's Lamp. For a price I could write down 1 - 3 or more wishes that I wanted to come true and, with Maria's assistance, would 'release' the secret harmoniser when I'd received it, amplifying its effects. Maria's psychic powers would make my wishes come true. I'm betting nobody had the good sense to wish for world peace and harmony.

Later in the year I received another paper talisman that was going to ward off bad luck. But I needed an IGR7 (the 7 being for 7 modes of action) to bring luck in. Nowhere did I see what the IGR stood for. It would be a protective shield, bring inner serenity, increase my personal influence and promote luck, peace and happiness. In this offer we learn that Maria is long experienced in the occult sciences, and knows lots of talismans. Perhaps that's how she knew that the first one was broken. At least that's what the next letter told me. It included a second talisman that looked identical to the first. And yes that same IGR7 offer was repeated.

This year I read that Maria had received news of critical importance about me and my immediate future. My case was apparently one of the most amazing she'd seen in ages. Since we'd met, something important intrigued her about me and it went through her mind whenever she thought about me. We apparently have a special relationship; it's more 'privileged' than those she has with other clients. For the record I've never seen Madame Duval and I'm not even convinced she's a real person. If I'd received a letter from anybody else with this sort of language I'd be looked for the hidden cameras and worrying that I was being stalked. This time Maria was offering her Personal Positive Magneto Psychic Aid that would essentially do the same thing all the other offers had.

Overleaf is a summary of the costs involved should I have been prepared to spend the money on all the offers. Had I taken up all the offers, with three wishes, and not sending in for the repeat IGR7 talisman, I'd have spent \$688.60, a tidy sum indeed.

During the year of letters the return company acting for M. Duval has changed from being Database Consultants to being Astroforce. Presumably having the same company name fronting worldwide makes things easier.

Now while Maria and Database Consultants/Astroforce were mailing all this stuff out, Bob Nixon was doing some background investigation. Contacting Database Consultants, and identifying himself as a member

of Australian Skeptics he learned that there were 70,000 records in the Maria Duval database, of which about 12,000 had bought the first offering.

Given that Great Britain is about three times as populous as Australia and has similar demographics, Australians' initial response rate is just half that of the British. Our actual buying rate is only 17% compared with their 40%. This would suggest we're a more sceptical bunch than the Poms, or it may just be that we're more apathetic and tight-fisted. I'd like to hope it was the former.

Database Consultants had received some complaints from the public and when Bob contacted them they were considering their future association with Duval. Helpfully they provided the name and contact details of Maria Duval's Australian front: a Kelvin Parker of Parker Marketing International in Queensland. In a fax last May I suggested that I thought the advertisements were misleading and offered him the opportunity to respond before I went to various authorities. A copy of that fax was sent to Database Consultants. Neither responded.

From the Database Consultants' numbers the gross earnings of the first offer are about \$1,025,400 – not bad for two month's work! From my contact at *The Age* I established that a double page in the weekly television guide only costs several thousand dollars. Allowing a high figure of say two dollars per letter and postage gives the estimated net earnings on the first offer as being about \$858,400.

Estimating total earnings becomes less exact, but if we allow for 10,000 people on average responding to all the offers then gross earnings for Maria Duval and Astroforce in Australia during their first year of operation could be as much as \$6,886,000; quite a nice little earner!

As with Astroforce in Great Britain the other revenue stream comes from selling the mailing list to third parties. In a more recent Maria Duval advertisement, from a December edition of *The Sunday Age's* television guide there is a box that could be ticked indicating that Maria Duval could send your name to vendors with quality offers. So far 'quality' offers have come in from:

- Canadian Equity Funding – \$29.95 (Canadian) gets you a crack at \$8000.00 or an 'Entitlement Premium'. The fine print shows that you're actually buying mer-

chandise from a list, most likely ending up with a Maria Giovanni 'Ruby and Diamond' pendant of which there are two million in the prize pool. This sounds like a grander version of the local school fete's lucky dip.

- Customer Enrichment Centre - \$8.00 gets you a crack at \$15,000.00. The reply goes an address in Milton, Queensland, but oddly the service centre details are those of Database Consultants/Astroforce. This time it's a game of skill and you increase your

Date	Offer	Summary of costs	Cost
1999			
11/3	Personal Prediction, Natal Study, Calendar of Lucky Numbers		\$85.45
2/4	Personal Dynamic Crystal		Free
6/5	Alleged non-prepayment of an order.		?
18/5	Personal guide to programming my 'dynamic' crystal		\$66.50
16/6	Automatic Money Trigger 3 Occult Actions + an original study, <i>Discover Your Power</i>		\$59.95 \$103.00
4/8	<i>The Great Book of Secrets</i>		\$60.95
15/9	Luck Harmonizer (sic), Wish Releaser for 1 wish		\$69.95
15/9	Luck Harmonizer (sic), Wish Releaser for 2 wishes		\$84.95
15/9	Luck Harmonizer (sic), Wish Releaser for 3 wishes		\$99.95
15/9	Additional wishes		\$15.00
	IGR7 Talisman		\$70.95
	IGR7 Talisman, second offer		\$70.95
12/11	My Secret Recipes to Success		\$55.95
10/12	Grand-Guide Prediction for the Year 2000		\$39.95
31/1/00	Personal Positive Magneto Psychic Aid		\$45.95

odds by answering questions correctly. Yeah right! One of the questions was "do you have a computer at home?"

- Instant Wealth Contest - \$5.00 gets you a crack at \$10,000.00
- Neo-Tech Publishing - \$145.00 gets you copies of *Neo-Tech Discovery* and *God-Man: Our Final Evolution*. These books guarantee: that I'll be having sex with beautiful women of my choice in less than a week, they'll fall in love with

me and be mine forever, I'll lose all my recurring illnesses (what about my short-sightedness?), I'll lose all my body fat, become very smart and I'll get an instant promotion. There was also a 90-day money-back guarantee. I exercised my intelligence here and didn't buy.

- National Lottery of the United Kingdom - \$45.00 gets a crack at \$500,000,000.00.
 - Rodale Health Books, Queensland – *Home Remedies for Women* \$53.85, along with the free *Your Hormones and Your Health*.
 - *Reader's Digest* – a free gift provided I actually subscribe.
- Say no more!

You can judge for yourself the quality of the offers. I'd reckon that the *Reader's Digest* was the best of a bad bunch and I'm no fan of theirs. Selling the mailing list to these sorts of organisations should top up the profits quite nicely. With only 70,000 on the mailing list currently I can see Maria doing more advertising in order to increase the profitability of this income stream.

While Maria has been busily writing away she has been awarded the Victorian Skeptics inaugural Green Pen award for services to writing rubbish that Skeptics can laugh at.

More importantly she's been investigated by other

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Y2K – what went wrong?

Peter Bowditch

This the text of a talk given by Peter Bowditch to a highly successful and well attended dinner meeting of NSW Skeptics on February 5. It follows up his paper “Y2K - Is it too late to panic?” presented to the annual convention in Adelaide, and published in the last issue. Peter can be forgiven if he sounds just a little smug, for his predictions in Adelaide proved to be remarkably accurate.

Even someone as skeptical of the hype as I was, was amazed at how little went wrong at the Y2K change-over. I monitored the Australian government’s alert line from midnight on the fateful day and the messages became more and more desperate as nothing happened. At one stage four countries were declared to be on amber alert – Gambia, Nicaragua, Nigeria and Sri Lanka. As you can see, these are major industrialised nations where problems could initiate a domino effect across world financial markets or maybe precipitate nuclear war. Some hours later, when it was reported that only Gambia and Nicaragua were still at risk, I felt much more confident.

When other reports of problems started coming in, I became afraid again. An ATM in London rejected some credit cards. An EFTPOS machine in Coles in Melbourne did the same. A water authority somewhere issued invoices with an incorrect date for payment on them. A video store in Adelaide told customers that their videos were being returned a hundred years late, immediately causing me to think that if I ran a video store, I would have done this deliberately to get myself some free publicity. (I have now heard that the video store was in San Diego. An instant urban legend.) The Western Australian birth registry people issued some incorrect birth certificates. Diner’s Club statements issued during January were only sorted by two-digit years and showed January 2000 charges before those for December 1999.

If I sound cynical, I apologise. I meant to hide it better. Things could have been very bad indeed. We have already had a couple of plane crashes this year big enough to make the evening news, but imagine how it could have been if Mobil hadn’t put the Araldite in the petrol to save us from participating in a plague of plummeting Pipers. Some things have got better, though. We had lots of train derailments around Sydney in December but only one so far this year. We have also only had one IOC corruption scandal and only two ticketing fiascos (but only one of them from SOCOG).

Since the start of the year, several more significant dates have passed without problems. There was the 3rd and 4th of January when people returned to work and switched their computers on, the 31st January when billing systems had to process the first end-of-month for the millennium, and, of course, 2/2/2000 which was not only the first date where the day equalled the month but the first all-even date since 8th August 888. Of course, 11 days were lost to the calendar since that date, so maybe we should adjust for that and worry about the 13th instead.



Peter Bowditch

A lot of people did very good work in inspecting and modifying computer systems during the time leading up to 31/12/99 and there is no doubt that the fact that I can joke about trivial problems now is in part due to this effort. A lot of money was spent on replacing equipment and software that was a few years old, but this should not be classed as Y2K expenditure - it was just the effective management and maintenance of assets that sensible companies should always have been practising. I have no problem with money well spent. I just can’t be convinced that the amounts of expenditure reported could be justified.

In fact, I believe that we have just seen the largest fraud ever perpetrated on Australian taxpayers, consumers and shareholders. Someone commented to me the other day that it didn’t matter how much was spent because it all added to a vibrant economy. Tell that to people who remember the houses of cards that poured money through the stock market in the early 1980s.

Estimates of expenditure in Australia range from \$10 billion to \$15 billion. The range of these estimates gives some idea of how reliable they are. The most commonly-quoted figure is \$12 billion, which just happens to be 10 times the amount that Alan Bond went to prison for stealing, so it’s not that much really, is it? Even the lowest figure suggested that no amount of damage that could happen after the start of the new year could exceed the financial damage that had already been done. The \$15 billion figure came from a highly-respected business statistics and intelligence organisation and was strongly influenced by their prior estimate of remediation costs. I suspect that nobody has any idea of how much money was really spent.

The big dangers to life, limb and society were going to come from the banks, the airlines, telecommunications and utilities. The only utilities I ever heard mentioned in NSW were electricity and water. For some

reason gas was never going to be a problem in NSW although I believe Victorians thought differently.

Let's look at water first. Water runs downhill, and I thought that that was unlikely to change with a change of date. The water that comes out of the taps at my place comes from a great big green tank on top of a hill in Baulkham Hills. These tanks are on the tops of hills all over the city. When the level in these tanks drops, pumps are started elsewhere to fill them up again from other reservoirs, much like the way your toilet cistern refills itself when the level drops. I imagine that the tank supplying my place has been supplying and refilling more than usual recently, but that has been due to increased demand because of the hot weather, not because the dates or times are anything significant.

Electricity is similarly driven by demand and again recent consumption figures would have shown a big spike because of air conditioning, pool filters and water pumping. Someone from one of the electricity companies finally snapped at a reporter's nonsensical questioning, just before new year, and told him that electricity would keep coming because they just didn't use transistors to switch 133,000 volts. Figures I've seen suggest that the water and electricity people spent about \$300 million in testing and remediation, which is not a lot of money when you consider the sizes of their operations.

Banks are supposed to have spent about \$1 billion among them. Again, this is not a lot when you consider the IT budgets of these organisations, but even then there is evidence of waste and extortion. I have a home loan and two car leases which the banks seem to have had no trouble setting up so that they ran across the end of time. In any case, the banks have all rewritten their major software applications over the last few years so no problems should have been expected. There were problems of management fear, though. I remember speaking to someone senior from ANZ who said that the minimum expenditure for the bank was going to be \$110 million because they had 55 million lines of computer code and the consultants had told them that it cost \$2 per line to fix things. This is a direct analogy to a plumber using the length of pipe in your house as a basis for charging to fix a leaking tap. Had the consultants locked themselves in a room for a year and played cards, the bank would have willingly paid an invoice of \$109 million and thought it was getting a bargain.

At the airlines, Qantas spent about \$200 million to find out that nothing serious was wrong. Ansett spent \$45 million, which suggests that someone there was thinking.

The telecommunications industry is interesting because we only had one company in the business ten years ago. Total expenditure has been estimated at \$1 billion, with Telstra accounting for \$400 million of that. I don't have much problem with Telstra spending big because they had a lot of history to catch up on. I just wonder where the rest went. Why didn't anyone at Optus or Vodaphone have the guts to say that, as every piece of equipment, every software program, and every procedure (either automated or manual) in the place was less than eight years old, why was any money being spent at all?

Looking at these big risk areas and making allowances for slack and waste, let's grant them total expenditure of \$3 billion. That is still a long way from \$10 or \$15 billion.

Let's look now at what was predicted to happen. Imagine someone gave you a black and white photograph of a sphere and asked you to guess its weight. You might think that nobody would estimate anything with so little information, but that was about how much was available to people estimating how much would have to be spent to find and fix all possible Y2K problems in Australia. This was a problem where nobody even knew what had to be looked for, let alone what sort of fixes would have to be applied. Nobody had even the slightest clue about how much remediation was going to cost, nor, for that matter, how much damage would be caused if nothing was done.

None of this stopped people from trying. An international business intelligence organisation estimated that preventive expenditure in Australia would be \$20 billion dollars. This number was a total fabrication. It was plucked from the air and sent out to subscribers to their information service, with an invoice attached to it of course. The same company is the one who is saying that actual expenditure was \$15 billion dollars and letting us know how lucky and efficient we were to get away with only that much. This figure is also ethereal, but had to be above other estimates of damage in order to prevent them from looking foolish. Being wrong by 1/3 is much better than being out by 100% when you are in the prediction business. In a delightful irony, these geniuses didn't know that Netscape Navigator has a bug in the date routines in the Javascript programming language, so the date on their web site clicked over from 31/12/1999 to 1/1/19100. Remember that this is the foremost (and the most expensive) Y2K expert outfit in the world.

Laugh! I nearly wet myself

What the prophets are saying now? Most of them aren't saying anything at all. Like most of the great predictors of messianic events in the past, they have either become invisible or are claiming that their predictions were misunderstood. At ten minutes past midnight on the morning of 1/1/2000, I posted a message to the Australian Computer Society's Y2K mailing list which just said "I just turned this thing on and everything seems to be working." I was almost immediately informed that nobody had said that things were going to fail on 1/1/2000, it was all going to happen after the weekend when people went back to work, 30% of small business in Australia would fail during January, just wait until next week, and so on. Oh yeah? This was coming from people who had been claiming just days before that a large percentage of computers would not even turn on, let alone run. I later posted a joke newsflash saying that Boris Yeltsin had resigned because his handlers were worried about his robotic components and that the Air India plane hijacking had ended because the kidnappers did not want to be in Afghani airspace on 1/1/2000.

Australia's foremost doom-and-gloomer accused me of passing on rumours when I should have been telling people how disaster was really going to happen on 31st

January. It has been going on like this ever since, with new Armageddon dates coming and going with increased desperation from the prophets. As I have mentioned, we have made it through the end of January and the first day-equals-month date. We have 29th February, 3rd March, 4th April etc to go, plus 30th June, 31st December and any number of other magic dates. One pundit has said that Y2K problems may even go on for three years.

Some of the prophets have just taken the approach to history shown in the book *1984*, where history is rewritten to suit the feelings of the day. These people just reinvented themselves as GST experts, despite GST having nothing to do with computers (because it is an accounting problem). I have already been told that GST will cost more than twice what Y2K cost (which was immediately transformed into \$24 billion dollars, which is 2 times 12). One supplier of multi-million dollar accounting software packages has already told its clients that implementing GST will take three to four months, with many consultants needed on site at all times during that period. This is despite selling the software in other countries where GST applies and having just extorted millions out of the same customers to look for Y2K problems.

Why is this relevant to Skepticism? Being a Skeptic is not just never believing things without evidence or proof, it is asking that the possibility of proof exists. It's the opposite of gullibility.

I resisted much of the Y2K hype for the same reason that I reject homeopathy, iridology, telekinesis, ESP and alien abductions. There is no mechanism of action. There is no way that the results claimed can happen given what we know about how the universe works. There is nothing that can stop water coming out of my taps while ever there is water in the reservoir and intact pipes between there and me. There is nothing in the date that can stop my phone working, but the bill might be wrong if I happened to be making a timed call at midnight.

Throughout the Y2K ordeal we saw supposedly intelligent and astute business leaders conned because they would not apply critical thinking when makers of invisible garments came to offer to make them some clothes. We saw them pay protection money to magicians who promised to remove curses and bring the sun back from the eclipse. We saw them purchase talismans to ward off evil spirits. We saw them sacrifice shareholders' funds just because someone authoritative asked them to. Is it any wonder that these same people join pyramid schemes, or happily accept increased health insurance premiums to cover quackery, or consult feng shui charlatans about office design, or listen to pundits who can predict the stock market, or spend huge amounts of money on ground up weeds to treat disease?

But have we learnt anything from the Y2K experience? When I look at the Y2K scamsters repackaging their spiels by the simple process of sticking hand-lettered "GST" labels on them, I doubt that we have.

...Clairvoyant from p 15

people. Michael Daly in the *Sunday Age*⁶ reported on the investigations of military defence specialist and writer, Peter Lewis Young. He was troubled by Maria Duval's claims and contacted the Vatican and other organisations and individuals with whom she claimed an association. He found there is no Vatican University of Parapsychology. Father Andreas Resch has never run a parapsychology congress, and he runs the only course in parapsychology in a Vatican University.

It's all a big lie. She never met the Pope, at a congress that never happened, at a university that doesn't exist.

The article reports that the Victorian Office of Fair Trading and Business Affairs is investigating the activities of the Maria Duval enterprise. We can only hope this investigation concludes soon, as Duval was still sending out material a month after the newspaper article was published. The article also suggested that Database Consulting was once again getting cold feet, and was considering cutting their links with Duval. To date this hasn't happened. It almost sounds like stock message when somebody threatens bad publicity.

The Maria Duval enterprise is a superb money-spinner, preying on gullible people's insecurities, hopes, fears and greed. Businesses like these need to be shut down. One can only hope that the Victorian Office of Fair Trading and Business Affairs rules against Maria Duval quickly.

Here's how I'd set up a similar operation. I'd invent an exotic sounding persona, get somebody suitably photogenic to pose for a photograph, then doctor up some foreign language magazine pages with suitable sounding material on them. Some people could probably translate the material so it would need to be grammatically correct, but very few people are going to track down the original publications to check if our purported articles were in them. Next, I'd create some fictitious associations with famous organisations – the Pope and the Vatican are good, but already taken. They'd need to be overseas in a non-English speaking country. This makes them difficult to confirm. That's the publicity taken care of. Now all that's needed are some magazine advertisements, and an outsourced customer service centre. It's all too easy. And if I put it on the Internet I might be able to escape all those pesky regulatory authorities.

Oops, gotta go. I'm off to register a business name: "John Paterson, the greatest virtual clairvoyant on the Internet." I'll need an ISP who doesn't ask too many questions, a web-page designer, and I'll start by advertising in Brazil – a cinch! Then I can sit back and watch the money start rolling in.

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Who says we're alone?

Carol Oliver

S.E.T.I. - the Search for Extraterrestrial Intelligence. Is it a bold adventure, worth the effort of devising the finely tuned, complex instruments needed for the task and employing the largest radio telescopes in the world? Or is it a waste of time? Is it only the sound of silence that will be heard forever and a day?

Some SETI scientists are convinced intelligent life is out there. It's only a matter of time. Others take a far more sceptical view that the universe is a big place and although some intriguing clues suggest life may be prevalent everywhere no evidence exists - yet. However there is general agreement there is sufficient reason for testing the hypothesis, the tools to do it should be used to test that hypothesis, and good science and science education can be done along the way. There is little doubt that if SETI were to succeed, then the payoff would far exceed the cost of doing the experiment.

The question is can it succeed? Does the evidence favour the idea that we might not be alone? Or are there some powerful arguments that suggest intelligence is a complex accident on Earth that cannot be repeated elsewhere?

Astronomers estimate the Milky Way galaxy contains up to 500 billion suns, and is one of at least one hundred billion other galaxies. This reality is relatively new - the current view of the cosmos by the newest telescopes suggests it is much more vast than was believed even fifty years ago. It's been known for much longer - centuries - that the Earth isn't the centre of the cosmos, and neither is our sun. Another reality is our solar system hurtles around the galaxy on an outer arm of the spiral form - languishing in a galactic backwater. There is nothing special about our position in the galaxy, and perhaps nothing special about suns having planetary attendants. Since 1995 we've known that other suns do have planets - the count is more than two dozen now. More planets outside our solar system are now known than in it. So not special again.

Even life itself may not be special. In 1996 NASA presented evidence that Mars may not be as dead as we thought - at least not in a distant past that may have been briefly suitable for microbial life to have evolved. The jury is still out on the meteorite from Mars - is the 'evidence' fossilised bacteria, or is it the result of chemistry? It is almost certain that Mars had a wet and warmer past some 3.8 billion years ago, and these conditions are conducive to life. Whether that happened or not will need some direct and non-ambiguous evidence. Mars, though, offers yet another perspective on mediocrity. Just this year NASA discovered that Mars

might have also had plate tectonics to a degree - something that was thought to be special to Earth. Other harbours for life may exist on Europa, one of the four moons of Jupiter spotted by Galileo just after the turn of the 17th Century. It appears to be enveloped by a warm, slushy ice sea where life may have gained a toehold.

So in all of this 'not special' and in the vast cosmos that seems to obey the same rules of physics and chemistry wherever we look, should it not also provide biology in great wealth? There is one very stubborn problem to solve - and the answer will come from finding other data points than the single one we have with Earth it-

self, hence the quest to find life elsewhere in our solar system remains a priority. The fact is we still do not understand how life got started on Earth.

Surprisingly there are no complete answers in either biological determinism or chemistry as eminent scientists like cosmologist Paul Davies have pointed out. The evolutionary clock cannot be wound back to zero, and chemistry has problems in divining life from nothing. There is no little neat theory that explains the biological equivalent of order appearing from chaos.

Even the simplest lifeforms are exquisitely complex, which creates another of those Big Questions. Is life inevitable and therefore everywhere in the universe? Or is it like the apocryphal monkey with a typewriter accidentally producing the works of Shakespeare? If the latter then, statistically, it can only have happened once in the universe and we are it. So, bound up in the question of how life got started on Earth is also the question Are We Alone?

Charles Darwin suggested that a warm muddy pond was the womb of original life, a theory that has won wide acceptance today. It suggests the Adam cell was conceived and born here, the progenitor of all life on Earth from which we are descended.

Somehow in this pond DNA formed too, the biological software that lines up the four-letter alphabet of the blueprint of life in exactly the right order to code for the proteins on which we are built. We do not know exactly when the first cell formed, or how and when the first membrane came into being to protect the innards of the cell - including DNA - from the outside environment.

DNA creates and maintains biology's hardware - our bodies and the rest of life's stunningly diverse constructions. The existence of life's blueprint is a riddle, worthy of the verse in *Alice through the Looking Glass*. DNA depends on the same proteins as it produces - a molecular level chicken and egg that poses the question, which came first?



Caroli Oliver

There are also arguments as to whether evolution is convergent, divergent or a bit of both. Convergent means that evolution is dependent on the environment, and divergent the reverse of that. SETI depends more on the convergent point of view – that given an environment on an alien planet that is similar to conditions found on Earth, intelligence will arise. These perceptions and puzzles are littered with potholes, some more like chasms than holes in the pathway to understanding the genesis of life.

The very first attempt at trying to create life in a laboratory flask turned out to be stunningly successful – to a certain extent. In 1953, two scientists, Urey and Miller, slammed energy into chemical soup similar to one that might have existed on Earth four billion years ago. The experiment **did** produce some of the building blocks of life - amino acids - but not DNA.

How can monomer amino acid molecules be made to stick together in a specific way to form long chains, polymers, including the exquisite double helix structure of DNA? Even though we know both the structure and composition of DNA no-one has succeeded in making it occur spontaneously – as the perception of Darwin's warm muddy pond scenario demands.

One suggestion has been that montmorillonite clay has the kind of lattice structure that lines up two amino acids, adenosine and guanine in ways that would promote polymerisation. It also readily interacts with the right sugars, fatty acids, amino acids and proteins. At the edge of Darwin's pond, such clay would have provided the circumstances needed. This kind of clay is globally widespread, but the theory of such use of clay remains to be proved.

Davies has characterised the Urey-Miller experiment as being like detonating a bomb under a pile of bricks and expecting a house to be built. Life did not form in the laboratory flasks, just as a house cannot be built by explosion. The warm muddy pond theory has some serious problems.

Wrapped up in all of this is the big question - and I put it slightly differently, not "are we alone?" but "who says we're alone?" We are now able to address the first question and debate the second. As the 21st Century begins, we are in possession of more knowledge about the universe than were our forebears. They could only wonder about intelligence elsewhere in the cosmos. Today's space and computing technology allows glimpses into the far reaches of the universe and renders our own solar system up close and personal.

I am going to argue that SETI is an experiment worth doing because the tools exist, it is a relatively low cost experiment and, with the exception of Project Phoenix (the only targeted search), makes double use of telescope time. Even if the experiment itself has null results good science and science education can be done along the way. SETI is a success even without succeeding at its primary goal.

Who said we're alone?

The actual question was 'Where is everybody?', posed by Enrico Fermi in the summer of 1950. Fermi, a brilliant scientist, won the Nobel Prize for physics in 1936, carried out the first controlled nuclear chain reaction at the University of Chicago in 1942, and was one of the key figures in the development of the atomic bomb.

Fermi asked the question at a lunch with fellow scientists. They were musing about whether Faster Than Light travel would ever be possible, having just unleashed nature's terrifying energy at atomic level. There was nothing to stop interstellar flight – only time, distance and the energy required for such a voyage. Time and distance seem very hard to overcome when viewed in biological terms. Travel to our nearest star system to the sun, Alpha Centauri, would take 70,000 years even at today's current level of rocket technology. Not a coffee and sandwiches job, and a great deal more time than a human lifetime, or even many of them.

However the age of the universe is a great deal older than our solar system. Current estimates put its age at 13 to 15 billion years, while our solar system clocks in at only 4.6 billion years. Such age provides time aplenty for both biological and machine intelligence.

SETI scientist, Dr Seth Shostak, made a calculation in his book *Sharing the Universe* that shows it shouldn't take very long in terms of cosmic time to colonise our galaxy. A society rockets off at one percent of the speed of light and spends 500 years in space, eventually finding somewhere to settle. The planet they choose cannot support a burgeoning society, so the society breeds another wave of interstellar explorers and these offspring then repeat the exercise at one percent of the speed of light for 500 years, and so on. At this rate the galaxy would be colonised in 20 million years - far less than the age of the universe. Even at our own maximum rocket speed of 0.005% of the speed of light, the billions of years available means there has been enough time for the galaxy to have been colonised at least several times over.

So what are the possible answers?

1. We *are* alone;
2. Others do exist, but they have no interest in communicating;
3. They exist, but our instruments are not yet good enough to detect them.

From this all sorts of other theories have been put forward:

1. Perhaps all scientifically literate societies self-destruct before becoming spacefaring;
2. Societies do colonise but run out of steam – such examples exist on Earth... the Chinese burned their boats because of a change in ideology and the Polynesians simply gave up – they never reached the coast of the Americas;
3. The Prime Directive – don't interfere with the natives until they are technologically mature;
4. We're not interesting enough yet;
5. They are aware of us and find us an interesting specimen. So we're in a zoo... the zoo hypothesis put forward by John Ball of Harvard University;
6. Interstellar travel is too costly;

7. Biology turns into machines and the machines become disinterested in the universe.

Note how many of these would require ET to be 100% compliant.

American astronomer Michael Hart thought it so likely that colonisation should have taken place that in 1975 he said we must be alone. Advanced societies would have built self-replicating robots to go forth and multiply and learn about the cosmos and eventually bring it home. This extraterrestrial intelligence should be everywhere, including here. Today, though, it could be argued robot probes might be nanotechnological – interstellar probes of molecular size and therefore invisible to us. With this idea they could be here... perhaps on your bathroom mirror... staring back at you. Now there's a thought! Still the idea of larger probes in the solar system cannot be dismissed. The solar system is relatively small compared with the rest of the galaxy – but it is still comparatively vast given our current technology. No thorough searches have been done and therefore the possibility cannot be ruled out.

Louisiana physicist Frank Tipler agreed with Hart, saying we're *it* - we're the galaxy's best and brightest. This may be so, but there can never be absolute certainty about it. The universe is simply too large to sift to the degree that would allow science to rule out intelligence elsewhere – one of the arguments levelled against doing SETI. However, there are powerful arguments as to why SETI is a legitimate scientific enterprise. The case against intelligence elsewhere is still filled with as many holes as the understanding of how life got started on Earth. For the moment the case to make a search, and perhaps over a very long period of time, is strong. It is cheap to do, it can make double use of our biggest research telescopes and other good science can be done along the way, science that wouldn't otherwise be done. In addition the clues are leaning towards a universe made for life rather than away from it, even though we have no other data point right now other than life on Earth.

SETI is now 40 years old. It has gone through many changes, including benefiting from dramatic advances in technology, and countries other than the USA joining the search from elsewhere on the globe. This includes Australia – a strategically important experiment because of its size and that the project is the only one that can reach the very far Southern sky.

The SETI hypothesis was originally built on numbers and the age and size of the universe. In the past few years this hypothesis has been bolstered by several discoveries – the extrasolar planets and the possibility of microbial life on Mars and elsewhere in the solar system.

The Drake Equation

Right from the beginning SETI astronomers have used an equation devised by Dr Frank Drake, now President of the largest SETI organisation in the world, the SETI Institute, to calculate the possible number of communicating civilisations in the galaxy and to think about their experiments on that basis.

Drake was charged by the Space Sciences Board of the US National Academy of Sciences in 1961 with pro-

ducing an agenda for a collection of the best brains available to evaluate whether a search for extraterrestrial intelligence was a worthy scientific endeavour.

He began by realising there were actually seven items that would determine whether we are alone in the universe or not. He wrote these on a blackboard in the meeting room at the National Radio Astronomy Observatory at Green Bank in West Virginia before the participants were due to arrive.

N = The number of communicating civilisations.

R = The rate of formation of sunlike stars (not all stars are sunlike).

fp = How many of those stars have planets.

ne = How many of those stars with planets includes an Earth-like planet.

fl = How many of those Earth-like planets develops life.

fi = How many of those life-bearing planets evolve intelligence.

fc = How many of those intelligences develop the technology to communicate.

L = The lifetime of interstellar communication by those intelligences.

Today Drake believes that equation comes down to just two terms: $N = L$, the number of communicating civilisations equals the lifetime of the period in which those civilisations communicate.

SETI does, by using radio telescopes, place limitations on the kind of intelligence that is detectable. Civilisations must, for example, also have radio telescope technology and be curious about the universe. They must be on dry land otherwise they wouldn't have the limbs to build radio telescopes or receive radio waves. They must also have the desire to communicate either locally within their solar system or directly to the cosmos. If it is the latter then it has to be on a generational basis since one-off messages are likely to be lost in the temporal nature of the universe. The moment a message reaches Earth might be exactly the time a project is not looking in the right direction or not observing at all.

Most SETI work today is done via radio, though optical is an emerging additional method. In fact any part of the electromagnetic spectrum, which includes visible light and radio, could be a possible area for sending messages, but the microwave region of the radio part of the spectrum is highly favoured. There are good reasons for this that have stood the test of time since the rationale was first suggested.

Two physicists, Morrison and Cocconi, outlined the rationale in a seminal paper in *Nature* in 1959 on communicating with extraterrestrial intelligence. They said that if an interstellar phone call were to be made then the quietest part of the electromagnetic spectrum was

the most likely place. Whispering in a torrent of background noise is almost pointless. This quiet part of the EM spectrum is also the place that the most common element in the universe, hydrogen, emits its own radio signal at 1430 MHz, caused by electrons reversing spin spontaneously. ET would also know these things and may use this as a universal marker to send a message.

That is not all. A little further along is the OH (hydroxyl) line – another natural radio emission. H and OH put together make water. Hence this area of the EM spectrum is termed the ‘waterhole’ by SETI astronomers – a place where travellers meet. This defines a special area in which to search, though there are still hundreds of millions of frequencies to search.

Drake carried out the first SETI experiment at Green Bank almost 40 years ago. He used just one radio channel to search two nearby stars, Tau Ceti and Epsilon Eridani. Today technology has allowed SETI to develop methods of searching millions of channels at once and is typically hundreds of millions of times more sensitive than that first project.

In the foreseeable future a SETI dedicated telescope will be built, probably at Hat Creek in California. This is a joint venture between the SETI Institute and the University of California Berkeley. It will consist of 500 to 1,000 small dishes, three to five metres in diameter with a total collecting area of 10,000 square metres. It will be equal to the new 105-metre radio telescope being built at Green Bank, but at \$25m will be a fraction of the cost. SETI astronomers will be able to search the entire microwave window from 0.3 GHz to 12 GHz through tens of billions of channels and search up to a million stars in every frequency in the range eventually. So SETI, in spite of being 40 years old, has really only just begun.

Other SETI searches today include: Project Phoenix (SETI Institute) 57 million channels using the 305 metre Arecibo radio telescope in Puerto Rico; SERENDIP (UC Berkeley) 168 million channels, also using Arecibo; Southern SERENDIP (SETI Australia) 58 million channels using the 64 metre Parkes radio telescope in New South Wales, Australia; META II (Planetary Society) using a 30 metre radio telescope near Buenos Aires and 8.4 million channels; SERENDIP Italia using a 28 metre radio telescope near Bologna with 4.2 million channels.

Australia actually has the best chance of discovery (though not guaranteed) because:

- * More stars can be seen from southern hemisphere where the galactic centre is located.
- * The project uses the Parkes radio telescope, which is currently discovering two new galaxies a day and one new pulsar an hour, due to the Multibeam Project that allows 13 parts of the sky to be seen at once.
- * It can spend more time on the telescope than almost any other SETI project at present.

SETI in Australia also pursues other science. This includes plans for a collaborative project with the Jodrell Bank radio telescope in the UK to undertake high resolution spectroscopy, which means using the SETI spectrometer to look at the universe in a higher resolution than is possible with normal radio astronomy.

In addition, SETI Australia undertakes development of educational projects linked to using SETI as a science education tool. In 2000 all high schools in New

South Wales will be using this tool for two five-week modules developed by SETI Australia in collaboration with the SETI Institute and with funding from the University of Western Sydney and the NSW Education Department. One module is for years 7 and 8, the other for years 9 and 10.

There have been attempts through the years by astronomers to send messages, but these have not been serious efforts at contact so much as expressions of our desire to make our presence felt in the cosmos, no matter how futile.

A plaque was attached to each of two spacecraft due to leave the solar system. Pioneers 10 and 11 were launched in 1972 and are now about 10 billion kilometres away from Earth. Frank Drake, astronomer and author Carl Sagan and Sagan’s then wife Linda devised the gold anodised aluminium plaque. NASA was heavily criticised for sending pornography into space – part of the plaque showed a naked male and female. Some newspapers carried pictures of the plaque with the man’s genitalia and the woman’s nipples air-brushed out.

In 1977 the same group devised a CD for Voyagers 1 and 2, launched in 1977. The CD was much less controversial with 100 photos of Earth, a range of music including Chuck Berry and Bach and greetings in 60 languages.

But none of the four spacecraft will reach another star system for tens of thousands of years. Much more significant was a radio message sent from Arecibo 25 years ago to celebrate a telescope upgrade. Drake composed the 1974 message, which was sent with a power that outshone the sun over three minutes. Aimed at the Hercules cluster 21,000 light years away, it will take at least 42,000 years to get a reply – if ET is there and listening at the time.

Clearly messages sent from Earth need to be sent repeatedly over many generations and societal conditions would need to be stable enough over hundreds and thousands of years to have the patience for this type of effort. It is the main reason why SETI confines itself to listening only at this stage. The hope is the older, more advanced civilisations we are most likely to discover will have solved this problem, therefore chances of proof we are not alone are likely to come far more quickly.

So... a universe made for life but to all intents and purposes are we the only ones? Or will the 21st century see first contact? Whatever your views on SETI, I would suggest the potential... the potential to succeed... is enough for us to look. SETI may well succeed too, without ever discovering ET. As we think about the implications of contact it offers a broadening of our appreciation of the differences between cultures and the difficulties in communication. It is the sociological contribution towards the scientific endeavours that help us inch towards the truth about our place in the universe. It is the place where science, arts and culture meet to produce a sum greater than the whole. SETI, therefore, is a logical quest. The tools exist to search, and there seems to be little reason **not** to use them to try to answer one of the most profound questions of all...

Are We Alone?



As old as time

Ian Plimer

Those Skeptics who are unlucky enough to have to confront the damage being done to science education by the pseudoscientific propaganda perpetrated by fundamentalist creation 'scientists' will often have heard the mantra the "radioactive dating is inaccurate". Professor Plimer nails this lie in the following thoughtful article.

When a geologist refers to old rocks, then how old is old and how is time measured?

Geology is the history of nature. A geologist is like a detective who visits the scene of the crime after it has been committed. From the few clues left, the detective pieces together what happened and when. The detective then tries to understand why the crime happened. The geologist arrives at the scene millions to thousands of millions of years after the event. The geologist makes observations and measurements, gathers clues, collects samples and uses sophisticated technology to extract as much information as possible from the samples. He then tries to understand what happened. As with the detective, if there is fresh evidence then the geologist's understanding of the events is modified. Nature can be very fickle and clues are normally concealed; the scene of the events needs to be visited many times and looked at with different eyes, as nature has left us with only a dim and discontinuous record with which to work. Experienced detectives can extract more clues from the scene of a crime than can a lay person. So too with natural science.

Natural science is like a jigsaw puzzle, however, in nature at least half the pieces have been concealed. Furthermore, any place on Earth is just one page in the book of time and to understand it, other pages backwards and forwards in time on different parts of the Earth must be read.

If a geologist wants to understand the history of Earth, then there must be a reading of the rocks by making basic observations and measurements. If there are drill holes or mines, then a three dimensional picture can be put together. Samples need to be collected for testing and the age of rocks needs to be determined by using the clocks in the rocks.

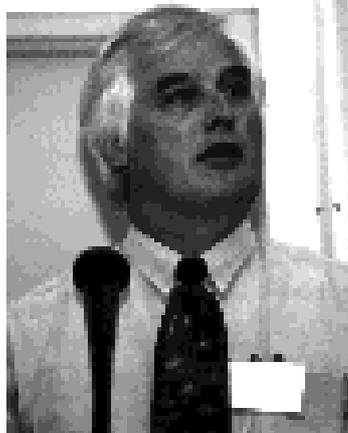
These are important matters, given the frequent misrepresentation of dating techniques being promoted by various groups in pursuit of their own political, commercial and pseudo-religious purposes.

Clocks in the rocks

There are five main methods of accurately determining the age of a rock. They are independent and rely on

totally different and discrete processes. A combination of these methods can be used to look at the complete history of planet Earth, ranging from deep time, thousands of millions of years ago, to the present.

The most common method is to use the decay of a radioactive element such as uranium, thorium, potassium, rubidium or carbon. Another method involves measurement of electrons captured in minerals as a result of a long period of bombardment by solar and cosmic radiation. The ever-changing magnetic field of the Earth is also used to determine when magnetic minerals formed, thereby dating the host material. Over time, biological material such as amino acids undergo decay and, by measuring the chemicals in old biological material, it is possible to calculate the length of time the biological material has been undergoing decay. As bones age, nitrogen is lost and fluorine is gained from ground-waters. The use of carbon dating (radioactive decay) combined with amino acid breakdown and bone chemistry change gives three totally independent methods of determining the age of bones.



Ian Plimer

The last method of age dating is a simple measurement of tidal or seasonal cycles. Tidal cycles are well preserved in some sediments and, not only have these been used to measure time, but they have been used to calculate Earth-Moon rotation and gravitation in former times. In summer, there is far more run-off into glacial lakes and sandy sediments are deposited on the lake floor. In winter, there is little or no run-off and a much thinner muddy layer forms. By counting the doublets of sediment layers, the summer-winter cycles in sediments in glacial lakes can be used to understand ancient climates and to measure the length of time that the glacial lake was active. Dendrochronology involves the measurement of the annual growth rings in trees. Not only can time be measured, but, by using the isotopes of carbon, oxygen and hydrogen, the history of ancient climates can be calculated.

All of these dating methods use independent techniques and technologies, and if, as is often the case, their results support each other, then the level of confidence in their accuracy is greatly enhanced.

Pub Time

The best way to understand how a geologist reads time is to retreat to the bar of your choice for a few scientific experiments using the drink of your choice and an empty glass. This is, of course, not a simple pleasurable drinking session. It is a serious scientific experiment to understand radioactive decay and the laboratory of your choice should be easy to find. Start with a full glass

of drink. Slowly pour out half the contents into an empty glass. If you know the speed at which you poured and the amount of liquid in either glass, then you can calculate when you started to pour the drink.

This is what happens with radiometric dating. Physicists have discovered that, over time, radioactive elements will decay into other elements with a different degree of radioactivity, or into stable (non-radioactive) elements. Experiments have shown that each radioactive element decays at a predetermined rate that is consistent over time, and it is this phenomenon that makes radioactive decay an accurate tool for the dating of things of great antiquity. If you have a known amount of a radioactive element, after a certain period half of the atoms in it will have decayed to the lower state, after the same length of time again, half of the remaining atoms will have decayed, and so on. The name given to this measurement parameter of radioactive substances, is their "half-life". Each radioactive element has its own characteristic half-life, and they range from microseconds to many millions of years. It is generally the case that the higher the radioactivity, the shorter the half-life.

A minute amount of uranium 238 (U238) in rocks decomposes to lead 206 (Pb206). It takes 4,680 million years for half the U238 to decompose to Pb206. (Thus the "half-life" of U238 is 4.68 million years.) The rate of change of U238 to Pb206 is known from experiments and evidence from nuclear reactors, so all that has to be measured in the rock is the amount of Pb206 and U238 and the age of formation of the rock can be calculated. U238, the heaviest naturally occurring substance on Earth, has been used for armour-piercing projectiles and as a counterweight in the tail of modern jet aeroplanes.

Like all scientific measurements, this process must be repeated by cross checking. It would be a pity to waste the drinks purchased for the scientific experiment and I'm sure you'll find a use for them. Start mixing your drinks and buy something completely different. Again slowly pour half the drink into an empty glass. If you know your pouring speed and the amount of in either glass, then you can calculate when you started to pour the drink. The same happens in nature. Traces of uranium 235 (U235), the material used in nuclear reactors and bombs, occur naturally in all rocks. It takes 704 million years for half the U235 to decay to lead 207 (Pb207). This figure is very accurately known and no nuclear reactor could work if this figure were wrong. By measuring the amount of Pb207 and U235 in the rock and by using the known rate of decay, the age of the rock can be calculated.

Minerals which contain small amounts of uranium and thorium are bombarded by particles as the uranium and thorium decay over time. Bombardment leaves a trail of damage in the mineral crystal called fission tracks. The older the mineral, the more fission tracks. Furthermore, if the mineral undergoes an event of heating after formation, the mineral reorganises and the fission tracks are destroyed. In this way, fission track dating can be used to date events of heating and cooling in rocks.

Again, this should be cross checked, so keep mixing your drinks. Try the same experiment with half the thorium 232 (Th232) in rocks decaying to Pb208 in 14,000

million years. Try it again with half the rubidium 87 (Rb87) decaying to strontium 87 (Sr87) in 48,800 million years. Do it again, this time with different drinks representing half the potassium 40 (K40) decaying to argon 40 (Ar40) in 11,930 million years. Again, try it with Ar40 decomposing to Ar39. By measuring the gas argon in rocks, the proportions of Ar40 and Ar39 can be computed to determine when a rock was heated to above 300° C, another method by which to calculate when rocks were heated and cooled. Mix those drinks again and try half the samarium 147 (Sm147) decaying to neodymium 143 (Nd143) in 106,000 million years and then again with half the rhenium 187 (Re187) decaying to osmium 187 (Os187) in 46,000 million years. Time for another drink, this time to demonstrate the decay of lutetium 176 (Lu176) to hafnium 176 (Hf176).

By the time you have mixed so many drinks you'll be somewhat weather-beaten and would have probably forgotten what you were trying to prove, but you would now have demonstrated numerous independent scientific cross checks in order to get an extremely accurate age of when a rock formed. I'm sure that this knowledge will make you feel much better the next morning.

Such methods can only be used for rocks that were once molten or had been cooked up to very high temperatures. Not only can these methods give the age of rocks, they can also be used to look through time, because many rocks are recycled and inherit characteristics from earlier times. If these techniques are used to date a rock that was once molten, then by looking through time, we can calculate what material was melted, for the sake of an example, mudstone. By looking through time, we can also measure when and where this mudstone formed, how many times it had been cooked up, when it had been cooked up and what the climate was like in the dim distant past.

Other tricks of the trade are that by looking through time, we can calculate when an area was uplifted to form mountains. Minerals form a logbook that records a long sequence of events in history. For example, this technique has been used for very detailed dating of rocks from the Broken Hill district and the latest scientific studies show that there is a very hazy and long history of events. Most of the rocks in the Broken Hill area were formed from volcanic rocks 1,690 million years ago. These volcanic rocks were melted from material which was formed at least 1,740 million years ago and there is some evidence that these 1,690 million year old rocks formed by melting material up to 3,100 million years old.

Time for a few more scientific experiments using glasses of drink. Our planet is constantly bombarded by cosmic rays that form materials such as chlorine 36 (Cl36) in water, beryllium 10 (Be10) on the land surface and carbon 14 (C14) in the atmosphere. Try the simple pleasurable experiments again to demonstrate half the Cl36 decaying to Ar36 in 310,000 years, half the Be10 decaying to boron 10 (B10) in 1.5 million years and half the C14 decaying to nitrogen 14 (N14) in 5,730 years. These materials are used to date more recent events. For example, we can use Cl36 to date how quickly polar ice forms and melts, how quickly lakes, rivers and harbours are filled with silt and the age of ground-waters. Ground-waters in many parts of the world formed

when there were warmer wetter climates. Ground-water is actually fossil water and hence it must be used with great care. In the Great Artesian Basin of Australia, ground-water is two million years old. If the water is wasted, we just can't sit around for millions of years waiting for the aquifer to be recharged in future times when we next have a warmer wetter climate.

The northward pushing of Australia under South East Asia carries surface Be10 to a great depth beneath Indonesia. By measuring the Be10 and B10 in modern Indonesian volcanic rocks, we can calculate that bits of Australia started to be melted beneath Indonesia about 50 million years ago and we can show that Australia was initially moving northwards at 1cm per month. This incredibly fast rate of continental drift has now slowed to about 0.5cm per month. Nevertheless, the collision of the Australian continental landmass with South East Asia has resulted in millions of years of catastrophic earthquakes and volcanoes in Indonesia. Furthermore, with the Be10, we can show how quickly Australia was being eroded over the last 20 million years and this gives us a good window into how quickly climate fluctuates from icehouse to greenhouse.

As a result of more than 2,000 nuclear blasts since 1945, minute quantities of radioactive fallout have been spread across planet Earth. On the land, this radioactive fallout resides in the soil. Fallout material such as radioactive caesium 137 (Cs137) are used to monitor and measure post-1945 soil erosion and land degradation. We humans have left a geological mark on the planet which appears as a thin radioactive layer in soils and sediments derived from soil erosion. This will be detectable for many millions of years to come.

Carbon dating is much maligned by those whose agendas are threatened by a truthful representation of the age of earthly things. Atmospheric carbon dioxide contains known relative proportions of two carbon isotopes, radioactive C14 and stable C12. Any living organism (including us) absorbs these isotopes in the same proportions and, on the death of the organism, no more carbon is absorbed. The C14 decays to N14 at a known half-life rate, so the proportion of C14 to C12 found in organic remains gives a method of measuring the time since the death of the organism.

In order to appreciate carbon dating, buy a large drink. Pour half of it into a second glass. Pour half of the remaining drink into a third glass. Again, pour half the remaining drink into a fourth glass. Do this experiment another two times and then see how much drink is left in the first glass. Very little. The same with C14. Half the C14 decomposes after 5,730 years, after another 5,730 years, half again has decomposed. As with the drink, after the original amount of C14 has been halved five times, there is so little of it left that it would be very difficult to measure. This limits the accurate use of C14 dating to less than 40,000 years which, in geological terms, is only yesterday. Material which formed after 1945 has been contaminated by C14 derived from radioactive fallout and hence can not be dated accurately. Carbon dating, like all techniques, has its limitations, but these limitations are well known and taken into account, so dates given by this technique (as with the others) are always expressed within margins of error.

The experiment has finished so it is now safe to drink every drop. Waste not, want not.

Time and a suntan

Beaches can be used to show another dating method. Anyone who has been sunbaking gets sunburnt and a darker skin. Go down to the beach and have a very good look at all the partially naked bodies, purely as part of a scientific observation, of course. By just looking at a person, we can tell if they have been in the sun for hours, days or weeks. Minerals, especially quartz, also get sunburnt and we can measure how long a mineral has been exposed to sunlight. Quartz exposed to sunlight captures electrons and these are trapped in the mineral. By heating the quartz in the laboratory, it emits light and the amount of light emitted is related to the number of electrons and hence the time that the quartz was exposed to sunlight. This is often used to measure the age of old beaches, campsites and soils which have been exposed to sunlight for a long time.

Magnetic dating

When rocks are heated above 580°C, the iron oxide mineral magnetite loses its magnetic properties. When rocks such as lavas cool, the magnetite inherits the Earth's magnetic field at 580°C. If we measure the age of the lava, using a method such as potassium-argon dating, and measure the magnetic field of the magnetite crystals in the lava, then we can calculate where on Earth the lava erupted. Using this method, palaeomagnetic dating, we are able to show the history of magnetic reversals, especially around the mid ocean ridges. Furthermore, the position of the Earth's magnetic poles is not the same as the Earth's geographic poles and, over time, it appears that the magnetic poles wander. This apparent polar wandering is not because the position of the magnetic poles changes greatly but because the continents are drifting.

Geology is the history of deep time. The techniques available now can measure when a rock formed, the age and type of the unseen material from which the rock formed, the post-formation history of heating and cooling of the rock and the date when the rock was lifted from depth to the surface. As we have seen, we can measure time very accurately using a great variety of different methods that are crosschecked as part of good housekeeping. The span of time on the Earth since its formation is so vast as to be almost incomprehensible. Given time, then almost anything can occur on Earth, and it has.

Old fashioned common sense

Accurate dating methods were only possible after the discovery of radioactivity. In the 19th Century, although such methods were not available, there was a consensus amongst scientists that the planet was very old. Exactly how old was old was not known.

Until the late 17th Century, most European Christians believed the biblical creation story literally. The first book of the Old Testament outlined a timetable of events for Earth history. In 1650, Archbishop James Ussher used biblical chronology and added up all the lifespans of the descendants of Adam. He calculated that the Earth was created in 4004 B.C. and this was entered as a marginal note in the King James Edition of the Bible in 1701.

There it stayed and, despite the scientific advances over the past 350 years, it is still adhered to as a matter of faith by the young Earth creationists.

The Industrial Revolution began in England in the late 18th Century. It included a technological revolution, and as miners tunnelled through rocks to win minerals to feed the new industrial processes, and as engineers built canals to provide transport for raw materials and finished goods, they acquired a great knowledge of rocks through which they tunnelled. Regular sequences of rocks were identified within which there was a regular sequence of fossils of now-extinct animals. For example, the canal engineer William Smith was able to show that distinctive fossils are found in the same sequence of rocks over a very large area of England. Simultaneously in the Paris Basin, Jean Baptiste Lamarck, Georges Cuvier and Alexandre Brongniart were able to show that there had been extinctions of life and that there were abrupt changes from marine to terrestrial sequences of rocks.

In the 1788, the Scottish farmer and businessman James Hutton made an observation at Siccar Point on the east coast of Scotland near Edinburgh. This observation changed forever the view of the Earth and showed that the Ussherian age was not consistent with the evidence revealed for all to see. Hutton found a sequence of gently-tilted sandstones which overlay nearly vertical shales and sandstones. The surface between the two sequences is called an unconformity. Hutton deduced a sequence of seven events at Siccar Point:

1. Rivers eroded an ancient landscape, shifting fragments of the bedrock as sediment down to the sea.
2. The material carried by the rivers accumulated at the bottom of the sea to form a sequence of muds, silts and sands which were buried and eventually became horizontal layers of rock.
3. These rock layers were uplifted out of the sea by movements inside the Earth. In the process, they were turned from the horizontal to the vertical, contorted and folded back on themselves.
4. Rivers flowed off the uplifted and contorted rock, wearing down the surface to a flat plain.
5. Subsequently, the flat plain subsided and became the site of accumulation of a new sequence of sands, carried by rivers from high ground elsewhere.
6. Another period of Earth movements uplifted and tilted the new sequence of sediments.
7. Rivers today are again wearing away the uplifted rock, creating the present landscape.

What clearer evidence was needed to show that rocks are a record of deep time? The clearest way to understand geological time is to map an area. Document the rock types, where the intrusions of granite and other igneous rocks occur, where the unconformities occur, where the rocks tilt, where the rocks are broken or folded and plot all these features onto a topographic map or an aerial photograph. Without using radioactive dat-

ing or fossils, a logical reconstruction of the order of events shows that the planet could not possibly be a few thousands of years old. Unconformities occur throughout the geological sequence on Earth, showing that at one place on Earth erosion was taking place eventually producing an unconformity and, at another place, sedimentation was occurring. The same occurs today. Unconformities are used to reconstruct old mountain chains and to look at the constant recycling of crustal material.

In 1862, William Thomson (later Lord Kelvin) used mathematics to calculate the age of the Earth. He assumed that the heat of the Earth is from the creation of the planet, that the Earth is cooled by conduction and that the Earth's atmosphere has remained at about the same temperature. By using the temperature of a molten basalt (1100°C), the thermal properties of rocks, the temperature gradients in deep mines, Kelvin tried to calculate how long the Earth had been cooling. He initially suggested that the age was somewhere between 20 and 400 million years and, with more refined calculations in 1897, he settled on an age of between 20 and 40 million years old. Only a few years later, radioactivity was discovered, and it was shown that Kelvin's assumptions were incorrect and the Earth was billions of years old.

The same common sense can be used today to get crude estimates of the age of the Earth. Measure how long it takes for a few layers of sediment to be deposited, measure the thickness of the rocks preserved in the rock record and then back calculate. Measure the volume of rock removed by erosion in a canyon, measure the rate of sediment flow in the canyon and back calculate. Measure the salt load and amount of water in the Earth's rivers, measure the salinity of the sea and back calculate. This was done by the Irish geologist John Jolly in 1899, and he calculated the age of the Earth at 99 million years.

Measure the volume of a granite intrusion, measure the thermal properties of granite, conduct experiments on the time required for granite to grow large grains, conduct experiments to show the temperature and pressure of granite crystallisation and calculate the time taken for molten granite to cool to solid granite. Whether this experiment is done using the measured hundreds of cubic kilometres of granite or hundreds of thousands of cubic kilometres of folded metamorphic rocks, the answer is the same. The planet is billions of years old.

Young Earth creationists would claim there is a scientific dispute about this matter: either the planet is a few thousand years old or it is billions of years old. They are wrong. There is no scientific dispute, nor are these claims two sides of any sensible question. The first claim is a matter of belief; a belief that is not supported by one scintilla of scientific evidence. The second claim is based entirely on scientific evidence, and this evidence, which comes from so many entirely independent scientific techniques, admits of no compromise. The Earth is many billions of years old.

The only way that the YEC position could be true would be if a preposterous lie had been written in the rocks by a supernatural being in whom they ask us to lodge our faith. If true it  ld be a misplaced faith.

Destined for success

Bob Nixon

Regular readers of this journal will be aware that I spend a good deal of my time trawling the world of new age/alternative/mystical magazines. I hope the reason has something to do with my desire to understand the world view that us Skeptics find ourselves up against so often, but I have to admit that sometimes it's just because such magazines are so giggle-making that it's hard to break the habit.

Your Destiny falls into the first category. While that Skeptic grin does appear from time to time as I read, it is all too quickly wiped from my face by the knowledge that this monthly magazine is presented as a genuine guide to the way to live your life. It's aimed squarely at the female of the species, and covers most of the more popular paranormal and new age technologies. Astrology features strongly, as do the machinations of psychics and seers of various sorts. In this series of articles I intend to examine in some detail the contents of *Your Destiny*.

I've chosen *Your Destiny* because it is among the newer magazines, having first appeared in July 1997 as a quarterly, but very quickly becoming a monthly offering. It is also typical of the genre of "women's magazines", but significantly skewed towards paranormal and new age subjects. In this first instalment I will look at one regular feature of the magazine, entitled "What We Got Right". This page three column details the predictions from previous editions that have allegedly come to pass. In the interests of space I shall limit my examination to the March – September editions of the magazine, seven months during which any psychic worth his or her retainer should have seen a number of things coming. The column first appeared in the second edition.

Working backwards, let's look at what claims are made by the "What We Got Right" column. I have summarised the entries.

September 1999 (6):

- Posh Spice's private nature. *Sonyya Bellarose, Aug 1998.*
- The Kennedy Curse. *Victor Voets, Jul 1997.*
- The on again/off again romance between Brooke and Andre. *Jennie Angel, Jan 1999.*
- Romantic problems for Catherine Zeta-Jones. *Kerry Kulkens, Aug 1999.*
- Pregnancy for Calista Flockhart. *Feb 1999.*
- Legal problems for Madonna. *Jennie Roberts, May 1999.*

August 1999 (3):

- Madonna to appear in another performer's video clip. *Svatava, May 1999.*
- Big screen success for Calista Flockhart. *Jenny Roberts, Feb 1999.*
- A large family for Posh Spice. *Sonyya Bellarose, Aug 1998.*

July 1999 (4):

- Brooke and Andre marriage breakup. *Sonyya Bellarose and Jenny Roberts, Jan 1999.*
- More money for Callista Flockhart. *Sonyya Bellarose, Jun 1999.*
- Relationship and weight problems for Kirstie Alley. *Kerry Kulkens, Oct 1998.*
- Family dominating the relationship between Uma and Ethan. *Simon Turnbull and Jenny Roberts, Nov 1998.*

June 1999 (6):

- Trouble in Yugoslavia would escalate into a major war. *Edward Tamplin, Jan 1999.*
- Peace talks in Northern Ireland would break down. *Edward Tamplin, Jan 1999.*
- Liz Taylor's relationships. *Sonyya Bellarose and Suzanne Myles, Sep 1998.*
- Baby for Sharon Stone. *Kerry Kulkens, Simon Turnbull, Wonda Feb 1999, Jenny Roberts Apr 1999.*
- Baby for Lucy Lawless. *Godfrey, Kerry Kulkens, Nov 1998.*
- Spiritual phase for Gillian Armstrong. *Simon Turnbull, Feb 1999.*

May 1999 (8):

- New boyfriend for Julia Roberts. *Jenny Roberts and Jessica, Feb 1999.*
- Love for Natalie Imbruglia. *Kerry Kulkens added that he would have blue eyes. Sonya Bellarose, Jan 1999.*
- New collaboration between Ben Affleck and Matt Damon. *Noel Sheean, Jan 1999.*
- Bad image for Gwyneth Paltrow. *Kerry Kulkens and Jessica, March 1999.*
- Magda Szubanski accident. *Godfrey, Jan 1999.*
- Babe 2 not a success. *Jennie Angel.*
- Magda Szubanski new film. *Sonyya Bellarose.*
- Age concerns for Mel Gibson. *Sonya Bellarose, Dec 1998.*

April 1999 (7)

- Love for Fergie. *Kerry Kulkens, Simon Turnbull, Bettina Davis, Nov 1998.*
- Bruce and Demi marriage problems. *Godfrey, Mar 1999.*
- Michelle Pfeiffer breaks from making movies. *Simon Turnbull, Colleen Bray, Jenny Roberts, Mar 1999.*
- Leonardo DiCaprio travel. *Simon Turnbull, Sep 1998.*
- Brad Pitt's stalker. *Kerry Kulkens, Feb 1999.*
- Ben and Gwyneth break-up only temporary. *Unattributed, Mar 1999.*
- Calista Flockhart in love. *Godfrey, Feb 1999.*

March 1999 (12)

- Prince Edward to marry. *Edward Tamplin, Jan 1999.*
- Demi and Bruce to reunite. *Godfrey, Sep 1999.*
- Anthony Hopkins to leave films and return to the stage. *Wonda, Feb 1999.*
- Mel Gibson to come home. *Sunny Jim and Simon Turnbull, Dec 1998.*
- Poppy King bounces back. *Jenny Roberts, Simon Turnbull, Jan 1999.*
- Sean Connery in a successful new film. *Simon Turnbull, Sonyya Bellarose, Nov 1999.*
- Virus out of control. *Kerry Kulkens, Jan 1999.*
- Record high temperatures in 1998. *Kerry Kulkens, Jan 1998.*
- Local house for Tom and Nicole. *Kerry Kulkens, Dec 1998, Simon Turnbull, Jan 1998.*
- New house for Cameron Diaz. *Kerry Kulkens, Dec 1998.*
- Cameron and Matt having trouble. *Jenny Roberts, Dec 1998.*
- The Gallagher boys problems with drugs and the legal profession. *Kerry Kulkens, Dec 1998.*

I have to give some credit to Sue Short, the editor of *Your Destiny*, for having the guts to actually list fulfilled predictions so prominently. My suspicion is that she had expectations of greater things, but was she to drop the column now the punters might just whiff a rodent. You will, no doubt, immediately notice that the above list of 46 contains only 4 entries that are not directly related to one celebrity or another. This is a feature of *Your Destiny*, lots of smiling familiar faces, not much to do with the real world. Those few significant events that do make the list are limited to places familiar to anyone not actually living 24 hours a day down a hole.

To save space and to avoid labouring the point let's just take the last of the above editions and examine the 12 "successful" predictions from March 1999 and examine them one by one. I hope the reader will get a feel for just what qualifies as successful under the rules used by *Your Destiny*. First up is that failed Royal Marine, Prince Edward. Edward Tamplin predicted in that the prince would announce his engagement during 1998. In fact the announcement came in the first week of 1999. Demi and Bruce have had an on again/off again relationship for some years and no doubt when they next split that too will appear as a "successful" prediction in a future issue. Anthony Hopkins is an actor who began his career on the stage. To say he has quit movies is an overstatement. Mel Gibson is coming to Australia to film a movie. Gibson also happens to have grown up in this country and has family here. Had the Gibson family turned up for a holiday this prediction would have also been "successful". Poppy King is among the better known and more successful of the new generation of business people – her recent difficulties notwithstanding. Here's a woman who started her business career while still a girl and has demonstrated a willingness to take risks, to chase dreams and to strive for success. It's simply impossible to imagine such a determined and talented person dropping her bundle because of one failure. Sean Connery is one of the most popular film actors in the world today. He could appear in *Noddy's Big Day Out* and the film would be a success.

The Virus outbreak that Kerry Kulkens claims as a hit concerns the Sydney flu. Kerry may not understand (although I suspect she does) that influenza mutates regularly and each new strain is named for the place in which it first emerges. To suggest that any strain of influenza is "out of control" in these days of immunisation is a gross overstatement. Kerry is also responsible for the claim that we would experience record high temperatures during 1998. Both her contributions are examples of the "it's gotta happen somewhere" method. With a prediction like this, it is impossible to miss, because somewhere there will be a report that meets the criteria. Simon Turnbull was absolutely and totally correct when he said that Tom and Nicole would buy a house in Australia, so I'll not argue with that one. Well done Simon and congratulations for being so highly accurate. Melbourne's own Kerry also predicted a new house, this one for Cameron Diaz.

The thing that immediately strikes one is the sheer banality of the majority of these "successful" predictions. Hollywood stars buying houses, for pity's sake. More than that, there are clearly people out there (quite possibly the psychics themselves) who must be trawling through international gossip magazines collecting the facts to back up their claim that they were "right". And I thought my reading habits were silly.

These, then, are the country's brightest and best psychics, touted by Ms Short as experts in their field. Their success rate is abysmal, their predictions utterly unimportant. Worst of all, they must know both these things, yet they persist.

And *Your Destiny* persists with its "What We Got Right" column.

In the next article in this series I will look at the contributors to *Your Destiny*, those brightest and best of the Australian psychic industry.



Scepticism is Good for You, Believe Me!

Sep Owen

*Almost all of us folk, be we peasants or kings,
Every day, all year round, will hear thousands of things,
And most of us, whether we're youthful or old,
Are, mostly, inclined to believe what we're told.
But some astute folk are now sounding a caution
That many a 'fact' is mere cunning distortion,
Or, at best, unintention'ly misleading blather,
Of which those keen critics would warn us, I gather.
Yes, here's what those Sceptics so wisely advise:
Be alert to the value of 'wherefores' and 'whys'!*

Recently Hunter Skeptics Supremo (and asteroid) Colin Keay delivered a talk to the Newcastle Probus Club. After he concluded, one of his listeners handed him this poem. We like it and congratulate the author. 

The lure of the masterstroke: or this month's miracle cure

Tony Trimingham

Tony Trimingham's is a name that is being increasingly heard in the drugs debate. After suffering a personal tragedy when his son died of a heroin overdose, Tony decided to do something about the public perception of, and reaction to, the tragic loss of life caused by this all-pervasive problem. He founded Family Drug Support to help families cope with it. We admire his work and asked him to write about it for *the Skeptic*.

Heroin is a substance that in one form or other has been around since before Paracelsus (his 'pill' concoction of 'laudanum' is reported to have included opium, henbane juice, the dried flesh of mummified bodies, salts of pearls and corals, bone of the stag, bezoar stone, amber musk and 'unicorn') - he also had a liquid form that had oranges, lemons, cloves, ambergris, saffron and wine tincture of opium - sounds much more palatable.

History has of course shifted this drug from 'God's Own Medicine' - the Pilgrim Fathers carried to the New World on the *Mayflower* - to the demon drug of the late 20th Century. Its modern form 'heroin' or diacetylmorphine was produced by the chemical giant Bayer - along with Aspirin - as a miraculous treatment of TB or pneumonia. After attitudes to the drug had changed Bayer aptly and not surprisingly produced its most widely used antidote - methadone - profits, profits, profits. This company incidentally has a direct connection to the production of other interesting substances - chlorine and phosgene (WWI poison gases) Zyklon - B (death camp toxin) and the still used military nerve gases tobun and sarin.

Formerly itself a famous 'miracle cure' it has of course given rise to numerous other 'cures' for heroin addiction in its interesting and chequered history. Back to history later.

Let's now switch to the impact of heroin on modern Australian families. I'll give you a brief overview of the impact it has had on our family and from that the birth of our organisation Family Drug Support. It will also give insight into the reasons families desperately want to get their kids off, thereby leaving themselves open to claims of miracle cures. People offering 'cures' - we get them all the time - ranging from the evangelical - those who have been helped personally by some intervention - Buddhist Body Cleansing, Jesus, twelve step fellowship, Narcanon (the Scientology 'cure'), various natural herbs, fruits, vegetables, roots etc, Chinese remedies, to medical pharmacotherapies promoted by sometimes saintly or generally greedy General Practitioners. Our organisation has been approached by all of them - probably the most bizarre being a monopoly like board game that would 'open the eyes of any addict' after one hour playing it. Our organisation has

always adopted a cautious approach to all treatments - we believe that anything may help anybody but nothing will cure all. What is certain of course is that there will always be the unscrupulously greedy willing to prey on the needs of families desperate to free themselves from the round of hope and despair.

My son Damien was 23 when he died - he was white, Anglo-Saxon and I guess middle class. He could have been female, 14 or 40, black, Asian or European, from a poor or rich family, from Toorak, Dubbo, Alice Springs or Cabramatta. The most sickening thing for me is to hear that 2500 people have died since he lost his life.

Damien was a talented person. State champion athlete, elite footballer, prefect, house captain, actor, poet and musician. He was loved by all his friends - and their parents. He was at times a person who lived close to the edge - he was fearless on the football field; in past eras he would have been first in line to enlist for battle. He had many qualities but he certainly was no angel, often getting into strife in his adolescence. The first substances he used were alcohol and tobacco as a young teenager and he certainly used his share of cannabis. When he left Chatswood High School in 1992 there was certainly no heroin in or around that school - something which has changed dramatically - which I found out on a return visit to speak last year. Two 13 year old girls admitted to me they were using. Up to the time that he was introduced to heroin along with his girlfriend about 16 months prior to his death, he had been in a stable job as manger of a service station and his girlfriend of three years was employed as a hairdresser. Damien had often expressed his negativity to hard drugs and so when I saw signs that caused concern - change in eating and sleeping habits, constant lack of money, niggling health problems - when I questioned him and got the answers "Don't be stupid Dad - do you think I'm crazy?" - I breathed a sigh of relief. What I didn't know until June 1996, was that he had developed a severe habit over an eight month period. Another couple, including Damien's best friend, had persuaded them to try it and what started as a social experiment quickly developed into a costly and isolating activity.

When we finally found out about everything we discovered that he and his girlfriend had been using about \$600 a day. They had gone through their combined savings - about \$30,000. They sold all their property of value and borrowed extensively from friends and strangers. They had stopped paying their rent and bills and I believe they were probably one step away from crime when his girlfriend's father discovered their debts and confronted them. I returned from a trip to England to find Damien on my doorstep with his sad and sorry tale.

Like most parents I was totally unprepared and un-

able to deal with the news. My emotions were a mixture of disbelief, anger and most of all fear. Unable to get much help or support from the services that I contacted, I packed him off to my daughter's home in the Blue Mountains. I had no idea what I was putting her through - somehow she and Damien managed to survive a cold turkey withdrawal. At that time I was using all the normal but negative coping strategies - denial, anger and self-blame.

My major denial came shortly after - when I thought that because he had stopped using, we were through most of the danger. It's common in these situations for families to breathe a sigh relief and think their problems are over. For the next eight months Damien was largely drug free. Occasionally drinking heavily and weighed down with guilt and a sense of failure he felt he'd lost all his friends. There were often times of optimism - he started mountain climbing, took up rugby training and had developed a new relationship.

What I didn't discover until reading his diary and journal after he died, was that in times of bleak despair he would take off for the city, secure some heroin, use it in a sordid isolated place like a back alley or public toilet, sleep it off and then return to the mountains. It was on the third or fourth of these trips that he died in February 1997.

After an argument with his girlfriend, and a heavy drinking session, he drew his last \$50 out of his bank account and caught the 7.30 train from Katoomba. Getting off at Central Station he walked to Bourke Street Pharmacy at Taylor Square where he bought his needle kits. This pharmacy normally turns over 8000 syringes in a week - the week of Damien's death was Gay Mardi Gras week and they supplied 15000 that week. He was discovered by a security guard in the stairwell of St Margaret's Hospital, Surrey Hills - ironically the hospital of his birth. By the time the guard called for back-up, and then called an ambulance - Damien had died.

It was to be three days before I was informed of his death - by telephone. Three months later when I got the autopsy report it told me how healthy he was. Not a thing wrong with any of his vital organs - he had the body of an athlete.

To lose a child to an early death is tragic - to find that the death was totally preventable is devastating. On top of this, to realise that in the eyes of the law and our society he died a criminal is heartbreak beyond belief. Three families a day in Australia are going through this kind of heartbreak.

In that part of my grief process, about six months later, I was in a real trough of depression, no appetite for anything. Nothing to look forward to. Just going through the motions of living. It was at this time that Justice James Wood handed down his findings of his Royal Commission into Police Corruption, Paedophilia and Drugs in NSW.

I could not believe the reaction of politicians from

both sides to his recommendations regarding heroin, such as injecting rooms and heroin trials. It all seemed just too difficult for them. One evening after listening to a politician ducking and weaving, I couldn't sleep. I got up at three in the morning and wrote a letter to the *Sydney Morning Herald*. After the letter was published there was significant media interest and eventually our story featured in the TV show *Witness*.

My phone started ringing and didn't stop for a week. Letters from parents were forwarded on from the newspaper. Most of the phone calls and letters were from family members of drug users. One of the first people who contacted me was the only child of the great Doc Evatt. She shared with me the fact that her 19 year old daughter had died some years earlier from a heroin overdose. Others talked of the shame and stigma - one

woman from Queensland had lost three children to heroin. The common thing about these phone calls were that the people were decent people from all walks of life who had done their best in dealing with the drug use. There were common themes - no immediately available de-tox beds or rehab places. Lack of support and even discounting of families by professionals. Lack of strategies for coping with all of the issues surrounding the drug use. One woman from a small country town rang about the recent death of her 16 year old daughter. She talked about her isolation and grief - she talked about the gossip - her daughter was a prostitute, she'd been murdered - all totally untrue. She had become agoraphobic because of her fear of confronting her uncaring community. She was also angry that

another family in the town who had lost a child in a rail accident had received emotional and financial support from that same community.

Rev Bill Crews from Ashfield Uniting Church, a man who had a history of ministering to minorities contacted me and said "Invite all these families to a public meeting". With little notice we held a meeting at his church - 450 people came and Family Drug Support was formed.

Not only did we start an advocacy campaign for families - writing to newspapers and politicians, educating the community, fighting for the rights of users and their families - we also decided to try and address some of the gaps that families were identifying as needing to be filled. Since then we have held our support groups that are an alternative to the 12 step groups like Narcanon and other more directive orientated tough love groups. Starting with three groups we now run twelve a month in Sydney and have others running in county areas like Albury and Wagga. Our bulletin *Herolnsight* which started as two pages now is a 36 page booklet which goes out every month to 1800 families across Australia and contains good up to date articles, poems and stories - this months issue contains the recent 'Call to Consciousness' message to his fellow

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judges by Justice Wood. We have developed a parent education kit *A Guide to Coping* which contains information and strategies for families with drug problems.

Our major project has been the establishment of our Telephone Support Line. Manned 24 hours a day, seven days a week. This 1300 number receives more than 25 calls a day at an average call length of 34 minutes from all over Australia. Not a counselling information or advice service, this is purely there to lend support and be a listening ear. In eighteen months we have run 12 training courses for 120 volunteers. Most of these volunteers have been personally affected themselves - either having lost children or gone through all the traumas associated with drug use.

Prior to my involvement in drug and alcohol matters, I had been a counsellor and group leader. For over 20 years I have counselled people with relationship problems and had a lot of experience in assisting people going through separation and divorce. There is a definite process in divorce recovery. Although it was far from apparent at first, I gradually started to observe the process of adjustment and change that occurred for people going through drug crisis. Like myself, the majority of families generally cope inadequately and negatively when first becoming aware of drug problems.

'Control and direction' is often the common strategy used. Fathers want to solve the problems quickly - mothers often become over-responsible and sometimes collude with the drug user to keep things secret from Dad. Relationships get strained, siblings become antagonistic and family systems start to crack. All of these aspects make the feelings of helplessness, confusion and sense of failure even greater.

I discovered from our earliest group sessions that simple education on things like 'The Stages of Change' model combined with a safe environment to 'tell their story' and support enabled attitudes to change and they started to report positive outcomes and strengthened relationships. Over time I saw fathers whose initial reaction to their sons' activities was to order them out of home, gradually change their attitudes and become supportive and guide them through lapses and other difficulties. I also saw mothers who had previously reclaimed property from hock shops to 'keep the peace' start to construct boundaries and engage their user into contracts with workable consequences.

In recent times I have been developing a closed group follow up to the less formal support group that provides a road map through the process. This group will be called 'Stepping Stones to Coping' and incorporate accepted drug and alcohol theory like motivational interviewing combined with the 'collective wisdom' of the group members in a model that is easy to understand and interactive.

And wisdom they've got - maybe not in the academic aspects of this issue - but certainly in pain, in perseverance and in unconditional love, some of us with great hindsight knowledge of intervention and strategies that may help others. One of the most difficult things for families to come to terms with is that their preferred goal of 'getting them off drugs' may not be achievable as quickly or as easily as they would like. Explaining the reality of the 'long haul' that may take many years

to get through the drug using process without ever taking their hope away is the most difficult task. Some families enjoy successful outcomes relatively quickly. I know three families whose daughters were entrenched in drug use three years ago. Their similar stories include prostitution, crime and chaos - one young lady is now stable on the methadone program, another totally drug free after getting pregnant and the third enrolled initially in a bupremorphine/methadone double blind trial in Sydney. After discovering after six months she was on a high dose of methadone she determined to get off and in six months had reduced to nil. Other families struggle for years through the ongoing cycle of hope and despair with little apparent progress.

I recently spoke to a Melbourne mum whose son died last November at the age of 31 after eleven years of heroin use - the astonishing thing was he had detoxed 41 times in that eleven years. Now here was a young man who wanted to give up but just hadn't been able to! Success is relative with this chronic relapsing condition. Families often ring our line in despair saying we have been trying to get him or her into de-tox for months. He finally went in on Saturday and left after six hours! Their despair turns back to hope again when I say "Isn't it good that he walked in - maybe next time he'll stay a bit longer". Family support seems to be a common denominator in the success stories I've seen.

We must never give up hope and also why among resourcing prevention, education, treatment, pharmacotherapy and supply reduction we just have to make some resources available to maintain life.

I spoke to a lady yesterday who rang me in great distress - her son, facing a robbery charge because of his drug use, had started methadone regime. Duly convicted he went into Long Bay gaol. His methadone dose was 20ml, which he reported to the prison drug clinic. At his first dose he was mistakenly given 120 ml - and he needed two shots of narcan to revive him. While waiting to hear of his progress at the prison hospital - a prison guard who knew she was his mother spoke loudly enough for her to hear "Why didn't they just let the junkie die?"

Another story concerns a woman who rang me a while ago and asked me to meet her for coffee. She was a woman in her early 40's who explained to me that she was a general practitioner. To my amazement she confided that up to the age of 29 she had been a heroin user. A prison sentence, two broken marriages, children taken away and attempts at every form of treatment available had got her nowhere. She explained to me that for her the single fact that at 29 she wanted to go to university did it for her. She has never used heroin since. I am sure there are thousands like her who with family support eventually reach their personal 'magic moment'. My son never had the opportunity to reach his - we must put in place strategies that allow as many people as possible to remain alive to reach this point. If it takes things that are distasteful like injecting facilities, heroin trials or even prescription heroin then for God's sake let's have the courage to do it.

"I woke up cured of heroin" was the headline in one of Australia's most popular monthly women's magazine in mid-1997 and it was the start of a phenomenon

that continues. Ultra Rapid Opiate Detoxification or UROD, otherwise known as the "Israeli treatment". The article described a clinic in Tel Aviv operated by Dr Andre Weissman and his organisation Cita. He was offering a process that involved nasal ingestion of naltrexone under deep anaesthetic: Naltrexone, which is an opiate antagonist and has been used for 20 years as a treatment for alcohol dependency - blocks the receptors in the brain which opiates act on - thereby rendering any opiate intake totally ineffective. Weismann's theory suggests that heroin dependence is purely physical - something that most people who know the impact of heroin including myself find improbable. The solution is simple - block the receptors and the addict is cured. My belief, shared by many others, is that as well as having a physical dependence most heroin users have a psychological and maybe even an emotional dependence of the drug.

Families started sending their children to Israel and other parts of the world in an attempt to be free of the menace. Houses mortgaged, businesses sold, the inevitable consequences of the desperate measures were for many total alienation as many of their loved ones returned to using - being unready for the treatment emotionally and psychologically. Our concern was always that the potential of naltrexone to be of real benefit for many would be lost with its tag of 'miracle cure'. It didn't take long for the greedy to latch on to the potential financial windfall. Private clinics run by doctors started offering various variants in the treatment. More focus as salesmanship than treatment and priced from \$8,000 to \$18,000 there obviously was no shortage of clients willing to fork out - especially when most of them were offering 92% success - verified by well known chartered accountants.

Our telephone line soon started getting sad calls from parents. One South Coast woman sold her business to finance her twin daughters and their boyfriends though the program. All four were soon back on the daily heroin round. One couple paid \$16,000 for treatment and were offered a free re-treatment should they 'fail' the first time. When they eventually did succumb and then go back to the clinic they were asked for \$2,500 each for 'medication costs'. Depression, suicide and overdose death were also part of the scenario for those who switched to the new medication. In an ironic four hour shift, I spoke to two mothers who had lost their sons to overdose. One was in despair because her son had taken the treatment, suffered intense depression and died via deliberate overdose. The mother was suffering guilt because maybe she had 'forced' him into treatment. Within an hour I received another call from another mother whose son had overdosed. This mother was feeling guilty because she had not been able to pay for naltrexone treatment that the boy had requested. 'Miracle' cures have been offered many times throughout opium's history. First we should name those who through history have praised the healing powers of opium. The aforementioned Paracelsus, the founding father of English clinical medicine Thomas Sydenham, Dr Benjamin Rush after whose 'heroic therapy' heroin was named, Oliver Wendell Holmes - Dean of Harvard Medical School and many others promoted the "wondrous healing power of opium".

One of the first narcotic remedy came via the well

known inventor Thomas A. Edison - a multi spiced compound which he called 'Poly-Form', 'Golden Liquid Beef Tonic', 'Lydia Pinkhams Vegetable Compound' - containing 21% alcohol! Pranto, Opacusa, DeNarco and Pierce's Golden Discovery were all laced with opium. Just like many anti drinking cures mostly contained alcohol these antidotes were full of the drug they claimed to be freeing the sufferer from.

Eugenic sterilisation was one of the 'cures' across America and eventually of course into Nazi Germany. The idea of 'bad seed' which would be eliminated by ending the ability to procreate.

Psychology, antitoxin theory and disease models are the polite terms - 'dope fiend', 'criminal madman', 'moral degenerate' are the less polite terms used extensively to describe heroin users in popular press over the last century.

The most recent 'cure' that I have been informed about is the Fukang (happy and healthy) tablet. It is made from 20 herbal ingredients grown in China and Tibet. These "natural detoxification" pills are made from the essence of various flowers, leaves and roots of a pharmaceutical factory publicly owned by the Gansu Academy of National Science and Technology. The State run Datan Drug Treatment Centre is running six day courses of treatment for both volunteers and police enforced compulsory patients. Wang Jihao, chairman of the company said "With the increase in heroin addiction it became very important for us to discover something to cure them", he said. "We had to undertake a lot of investigation and research. We concluded we had to provide a new medication and we began with the proposition which is central to understanding Chinese medicine that because heroin is an extract from a plant, there must exist in nature the antidote to its harmful effects".

I think I have heard it all before!

There is now a commercial group attempting to launch the treatment in Australia, North America and Europe. This treatment may prove beneficial to some - as long as the hype is kept to a minimum.

In the meantime we need to accept that for many families the struggle will continue in the foreseeable future.

Family Drug Support Hotline is 1300 368 186. Our Bulletin, *HeroinSight* can be ordered by ringing 02 9427 8052 or writing to FDS, PO Box 226, Willoughby NSW 2068.



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Evidence of remote viewing?

Paul M. Brown

Introduction

In the 1970s Harold Puthoff and Russell Targ at the Stanford Research Institute (SRI)¹ (Menlo Park, California) conducted a study to investigate the ability of certain individuals to view a remote location via another person who is present at the location by reading their thoughts, or “remote viewing”. The results of the study, which generated some controversy (Targ, Puthoff & Targ, 1979, pxvii), were published in the *Proceedings of the Institute of Electrical and Electronics Engineers* (IEEE) (Puthoff & Targ, 1976); a portion of this work was also published in the well known and widely circulated journal *Nature* (Targ & Puthoff, 1974, pp602-607). I provide here a critical discussion of the methods used by these scientists.

Methods

The study involved six subjects (three considered experienced in remote viewing and three learners). Target sites were randomly selected from a pool of more than 100 sites in the San Francisco Bay area (all were within a 30 minute drive of SRI). The subject was closeted with an experimenter and told to describe (for approximately 15 to 30 minutes) a location where two to four experimenters were present. The subject waited 30 minutes before proceeding with their description to ensure that the experimenters had arrived at the target site. The experimenters were not aware of the target site location until necessary. The experimenter who remained with the subject was unaware of the target site location and was used to help clarify the subject’s descriptions. Each subject provided a recorded description and any illustration they felt necessary (the description was recorded on a tape recorder). Once the subject had completed their description of the target site an informal comparison was made between the description and the target site, and the subject was taken to the target site to provide feedback (although the subject’s description remained unedited). The investigators were careful in carrying out the experiment to ensure that the target site locations remained confidential as required. (For more information on the design of the study see Puthoff & Targ, 1976, pp334-335, or Jahn, 1981, pp39-41)².

There is a major problem with a study of this nature, ie, how to quantify the “correctness” of a description of a target site. What must be considered when judging the description provided by a subject? First we must note the number of objects that are viewed by the investigator at the target site and are included in the subject’s drawing and worded description³. But how specific should a subject be? For example, a house should be correctly identified, the number of windows on one side of the house should be correct, etc. We should also consider whether or not the objects, if correctly identified, are described in their correct positions

relative to other objects. Puthoff and Targ note that “left to right reversal is often observed in paranormal perception experiments” (Puthoff & Targ, 1976, p335). They seem here to be suggesting that because not just one or two objects were incorrectly positioned but “most” objects were placed in the opposite position that this is significant. Because it is the opposite of what it should be, it is correct? Quite the opposite. (Are they always seen in reverse? Do only certain individuals see in reverse? Why wasn’t this investigated?) Are the distances between the objects in the subject’s drawing approximately proportional to the actual distances at the target site? How could we possibly assign a numerical value to represent the correctness of some description given these considerations?

We could eliminate the problem of having to assign a numerical value to the correctness of a description in a number of ways. For example, we could reduce the target site to a single object (a tree, a building, a swimming pool, etc). (One of the problems with Puthoff and Targ’s study is that target sites are not strictly defined; ie, no boundary is defined for each target site.) The task for the subject would then be to select the correct object from a list. (Although such a design might pose a problem, because as Puthoff and Targ note: “... most of the correct information related to us by subjects is of a non-analytic nature, ie, to shape, form, or colour, and material rather than to function or name;” Puthoff & Targ, 1976, p339. In other words, generally speaking, inaccurate descriptions are provided by subjects.) Alternatively, we could provide the subject with photos of each target site and request that they select one of the target sites as the current location of the experimenters. Such designs would give rise to dichotomous data (ie, the descriptions could be unambiguously classified as either correct or incorrect) and results which could be more easily interpreted⁴.

To obtain a numerical value to represent the “correctness” of a description given by a subject for a certain target site an investigator visited the target site and ranked the descriptions provided for all target sites based on how well they matched this target site (a rank of 1 was assigned to the description which best matched the target site, 2 to the description which was the next best match, and so on). This investigator visited each target site in turn ranking the descriptions provided in this way (the investigator received the descriptions in random order). The ranks assigned by the investigator to the descriptions at their respective target sites were summed; a smaller sum indicating that the subject provided descriptions which more closely matched their respective target sites. To test the null hypothesis (i.e. remote viewing has not been achieved) the probability that a sum less than or equal to that obtained occurs by chance was calculated as follows:

$$\Pr(S \leq s) = \frac{1}{N^n} \sum_{i=n}^s \sum_{l=0}^k (-1)^l \binom{n}{l} \binom{i-Nl-1}{n-1}$$

Formula 1

where:

s is the sum of the ranks,

N is the number of assignable ranks,

n is the number of times rankings were made (in the experiments considered here N(n), and

l assumes values from 0 to the least positive integer (k) in (l-n)/n (Puthoff & Targ, 1976, p335).

By assigning ranks to the descriptions in this way we are treating a rank of 2 as a partial success, a rank of 3 as a little bit less successful, etc. It should be clear to the investigator on most occasions whether or not the subject has successfully viewed the target site. If a subject actually is capable of remote viewing then we would expect the description they provide for a given target site to be by far the best match for that site in comparison to descriptions provided for other target sites (provided that the target sites are reasonably different⁵). Thus, a rank of 2 or more must be considered as a failure; ie, it doesn't really matter whether a rank of 2 or more is achieved since the corresponding description in all cases will, most likely, be of poor quality. Granted one may be worse than another, but probably only in a trivial sense. It should be emphasised that a rank of 1 does not necessarily indicate a good description either (Puthoff and Targ note that it is a "... judging procedure that ignores transcript quality beyond that necessary to rank order the data packets"; Puthoff & Targ, 1976, p34). However, if many ranks of 1 are achieved than this could be said to provide evidence of a remote viewing ability. Therefore, we must concentrate on the number of direct hits the subject achieves (a direct hit is a rank of 1) and thus treat the data as dichotomous. If we ignore the number of direct hits and consider only the overall sum the results can be misleading. For example, consider the case N=10 (ie, 10 target sites). A sum of s(39 in the formula above with N=10 (and therefore, n=10) yields a probability equal to our significance level (ie, 0.05); see Puthoff & Targ, 1976, Table 1, p336. To obtain a sum of 39 we could have at most six direct hits and at the very least, none. Obviously six direct hits out of 10 is a lot more convincing evidence of remote viewing than no direct hits at all, and yet both lead us to the reject the null hypothesis with the same

degree of certainty. Should we reject the null hypothesis if the subject has not achieved one direct hit? Although in this case we must conclude that the matching is better than random, the results would suggest that this is not due to successful remote viewing by the subject.

Results

Puthoff and Targ (1976) used Formula 1 above to analyse the data generated from their study; the results from the five experiments carried out involving eight subjects are summarised in Table 1 below. (It seems paradoxical that although subject S1 received more direct hits than S4 the probability for the latter subject is smaller than for the former.) In order to use this formula it is necessary to assume that if the null hypothesis is true then a description is equally likely to receive any rank at each target site; ie, the rankings are independent for the target sites. Since the same investigator ranked the descriptions at each target site the rankings are not independent as required. In a later publication Puthoff and Targ recognised this and reanalysed the data⁶⁷. These corrected results do not differ markedly from those originally reported and our conclusions are not affected (see Jahn, 1981, Table 2, p46).

Note that it is possible the investigator who carried out the ranking (either consciously or unconsciously) tended to rank a description poorly if it had already been ranked highly at another target site. If this is the case then 7 out of 9 direct hits as achieved by subject S1 (according to one judge) may not be as impressive as it seems, since the more direct hits achieved the more likely a direct hit will be achieved at the next target site. Our confidence in this result is further diminished by the lack of agreement between matching provided by other judges. As a "back up judging procedure" five judges were used to blind match the descriptions provided by the first subject to the target sites. The number of direct hits given by the judges were: 7, 6, 5, 3 and 3. The variability in responses is an indication of the quality and vagueness some descriptions must have (Puthoff and Targ state that some of the responses provided by judges which were used in the data analysis were only considered by the judges to be "probable matches"; Puthoff & Targ, 1976, p346). This back up judging procedure was also used for the experiment involving subject S4. The five judges this time recorded the following numbers of direct hits: 5,3,3,2,2.

These results are still far better than chance would allow. Should we accept that remote viewing has been achieved or is there an alternative explanation? Marks

Table 1. Summary of results

Subject(s)	No. of target sites	No. of direct hits	Sum(s)	Pr(S(s))*
S1 (experienced)	9	7	16	2.9(10 ⁻⁵)
S2 and S3 (experienced)	8	3	15	3.8(10 ⁻⁴)
S4 (learner)	9	5	13	1.8(10 ⁻⁶)
S5 and S6 (learners)	7	2	20	0.080
S7 and S8 (learners)	5	3	8	0.017

and Kammann (1978) carefully examined the descriptions provided by subject S1 and found that it pays to be sceptical. They discovered that a number of cues existed in the descriptions (recorded on tape) given to the investigator for matching and that these cues were helpful in matching because the list of sites given to the investigator was not in random order but in the original (correct) order. Some of the cues included:

- * Price expresses apprehension and an inability to do this kind of experiment (target 1);
- * a reference is made to the fact that this experiment is the "second place of the day" (target 2);
- * a reference is made to "yesterday's two targets" (target 3);
- * Targ says encouragingly: "Nothing like having three successes behind you" and mentions the nature reserve visited the day before (target 4);
- * Price refers to Marina which was the fourth target (target 7).

Using these cues Marks matched the descriptions to the target sites with significant accuracy (five out of five direct hits with $\Pr(S < s) < 0.0005$). However, when the cues were removed other judges did not achieve statistical significance. (Only five of the original nine target sites were used because the descriptions corresponding to the remaining four sites had been published, in part, revealing which site is the correct match for each. Note that these are probably the four best descriptions provided by the subject.) Thus, this information revealed by Marks and Kammann may explain the better than chance results observed⁸.

Concluding Remarks

The results generated from the study referred to above have been discussed in a number of books and journals in addition to *Nature* (1974) and the *Proceedings of the IEEE* (1976); for example see Jahn (1981), Targ & Puthoff (1977), and Tart, Puthoff & Targ (1979). In relation to these results the following comments have been made (with or without the information gained from Marks and Kammann's investigations): "striking evidence" (Targ, Puthoff & Targ, 1979, pxiii); "clearly indicated the presence of an information channel of useful bit rate" (Jahn, 1981, p45); "successful experiments that demonstrate the existence of remote viewing" (Targ & Puthoff, 1977). (The results have even been referred to more recently without serious criticism, see Goswami pp130-133 1993; hence the reason for this paper.)

In contrast, I feel that these results are tentative at best and further research is required to substantiate them before we can conclude that we have the power of remote viewing. Puthoff and Targ stated that their "principal responsibility" was "to resolve under unambiguous conditions the basic issue of whether or not this class of paranormal perception phenomenon exists" (1976). This goal was not realised.

Notes

1. The Stanford Research Institute is now known as SRI International.
2. One other experiment was carried out using tar-

get sites located in SRI. The methods were slightly different for this experiment (for example, the number of possible target sites was smaller and thus some were used on more than 1 occasion) so it is not considered here to avoid confusion.

3. According to Puthoff and Targ we are interested not just in the objects which are viewed at the target site by the investigators but also objects which the investigators could have, but didn't, view. They note that "... one subject (S4) described and drew a belt drive at the top of a drill press that was invisible even to the remote experimenter who was operating the machine; another subject (S1) described a number of items behind shrubbery and thus not visible to members of the demarcation team at the site." (Puthoff & Targ, 1976, p346). Even when the subject is wrong he is right!

4. Another possibility, of course, is the well known "card guessing" experiment. Puthoff and Targ note that in card guessing experiments the results are less convincing. They suggest that the subject is more likely to approach a remote viewing experiment with a "blank mind" (Puthoff & Targ, 1976, p346). I personally do not believe that it is a coincidence that as the statistical design is improved the results produced become less convincing.

5. Target sites used in the study included a swimming pool complex, tennis courts, a bicycle shed, and City Hall.

6. It should have also been noted that the binomial calculation made to analyse data from an early pilot experiment (see Puthoff & Targ, 1976, p331) requires independent judging for each description, in contrast to the one judge (Dr Puthoff) which was actually used.

7. The method used is an exact test obviating the assumption of independence; see Jahn (1981, p45) for details.

8. See Marks (1981) and Marks & Scott (1986) for follow-up discussions of Marks and Kammann's results.

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Announcement

Third International Skeptics Convention

University of Sydney

November 9-12, 2000

The Third International Skeptics Convention to be held in Sydney from November 9-12 is beginning to take shape and subscribers are advised to start planning early.

The convention will focus on three important human concerns that Skeptics recognise as making paranormal, pseudoscientific and other irrational claims so attractive to so many people: Health, Wealth and Wellbeing.

Therefore the Convention will be divided into three main themes, with one day to each theme.

Wealth

On Friday, November 10, the focus will be on dubious methods of separating people from their money. The lure of instant riches is a potent one and many are the paranormal and other scams seeking to take advantage of anyone foolish enough to participate. Nigerian letters, \$5-a-minute "phone a psychic" hot-lines, "high-tech" racing tipsters, ultra-high-return Ponzi schemes, Golden aeroplane pyramids - they are many and varied but they have two things in common. They all promise something for nothing and the only people who benefit are the promoters.

An international team of expert speakers will address these issues and more, and will include financial experts, professional magicians, representatives of government consumer protection agencies and others.

Wellbeing through critical thinking

The key to wellbeing in a complex society is the ability to think critically. On Saturday, November 11, this topic will be addressed by an expert panel of scientists, philosophers and Skeptics from around the world who will look critically at the wide range of issues that confront us as Skeptics.

Health

The 20th Century is when the practice of medicine truly became scientific for the first time, but as we approach the 21st Century we see an increase in support for unsubstantiated hold-overs from an earlier age. On Sunday, November 12 we will hear from a distinguished panel of international speakers who will address what this means for our health as individuals and as a society. And it will not be confined to human health. One

field in which dubious "alternative" treatments is making serious inroads is in veterinary medicine, and this area will also be addressed.

Other sessions

As well as the main programme in the Wallace Theatre, each afternoon we will be conducting concurrent speaking sessions on Skeptical related topics in separate rooms nearby. Subscribers are invited to offer abstracts of papers they would like to present during these sessions. We cannot guarantee that everyone will be presented, so we ask that you send us your suggestions as soon as possible.

As well we are hoping to make available a number of display booths in which Skeptics groups can show off their own particular areas of interest, and other organisations, such as publishers, regulatory authorities, etc, can offer their products and services.



Social activities

A Skeptics Convention would not be complete without its lighter side and two social functions will add to the enjoyment of visitors. On Thursday evening (Nov 9) we will be holding a welcoming cocktail party in the Nicholson Museum at the University of Sydney. Guests can mingle with other Skeptics from around the country and around the world, amid the museum's fine collection of artefacts from ancient civilisations.

On Saturday evening (Nov 11) we will be holding a Skeptics Dinner Cruise on Sydney Harbour, where, as well as food, we expect to provide entertainment as we cruise one of the world's great waterways.

Our aim is to use this Convention to spread the word that to be a Skeptic is not to be a negative naysayer, but to be a positive influence for improving our society. As well as being instructive we also intend that the meeting will be entertaining and we will ensure that the element of fun will be prominent among our objectives.

As an international event, this will be one of the most ambitious and expensive projects we have ever contemplated. We do not plan to incur a loss, so this will be a more expensive convention than previous national events. Full details will be included in the next issue of *the Skeptic*.

Prominent speakers accept invitation to attend International Convention

Invitations to participate in the Convention have been issued to a number of prominent Skeptical speakers from the USA, UK, New Zealand and India, as well as from around Australia, and we will have a complete list in the next issue of *the Skeptic*. Among those who have already accepted our invitation to speak at this convention are:

USA

Prof Paul Kurtz, philosopher, Emeritus Professor at SUNY, in Buffalo, NY, founder and chairman of CSICOP, publisher of Prometheus Books, and the driving force behind the foundation of the modern Skeptical movement.

Joe Nickell, author of many Skeptical books, magician and Chief Investigator for CSICOP

Bob Steiner, accountant and magician. Author of *Don't Get Taken* and the original "Steve Terbot" a hoax psychic used by Australian Skeptics in our early days to get us noticed.

UK

Dr Richard Wiseman, Senior Lecturer in the Dept of Psychology at the University of Hertfordshire. Richard researches and experiments parapsychology and paranormal beliefs from a scientific perspective.

Australia

Prof Mike Archer, Director of the Australian Museum, leading palaeontologist and discoverer of the Riversleigh fossil beds in N Qld. Australian Skeptic of the Year for 1998.

Prof Simon Chapman, University of Sydney. Prominent researcher in public health matters especially as regards smoking and immunisation issues.

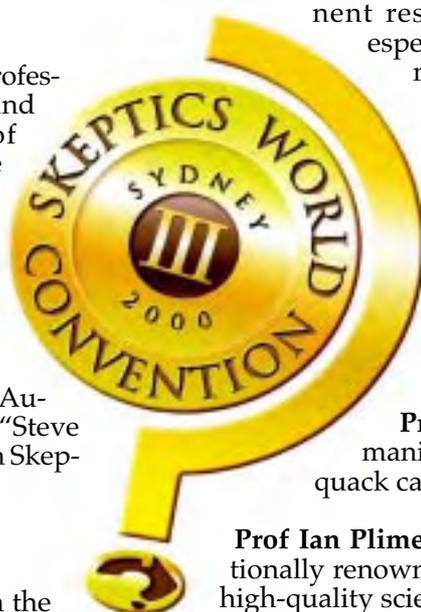
Dr Geoffrey Dean, chemist and one of the world's leading investigators of astrology from a Skeptical perspective.

Prof Macieg Henneberg, University of Adelaide. Biological anthropologist, anatomist who is researching human evolution.

Prof Ray Lowenthal, University of Tasmania, oncologist and leading expert on quack cancer remedies.

Prof Ian Plimer, University of Melbourne, internationally renowned geologist, and avid proponent of high-quality science education.

Rosemary Stanton, one of Australia's leading nutritionists.



Volunteers required

Organising an International Convention requires many skills. Any subscriber who wishes to assist in the organisation is requested to contact us at our Post Box. Please let us know of any special skills you have that might assist us to make the event an outstanding success.

Write to:

Volunteer
Australian Skeptics
PO Box 268
Roseville NSW 2069

Billets required

As we expect many interstate and international visitors for the Convention, we ask subscribers who are prepared to billet one or more visitors to write to us with the details.
Write to:

Billets
Australian Skeptics
PO Box 268
Roseville NSW 2069

Ponzis, pokies and punters

Richard Lead

Ponzis

Albania holds the distinction of being the only country to be laid waste by a pyramid scheme. In 1988 the country emerged from a closed communism to embrace the wonders of western capitalism. The first pyramid scheme (technically, a Ponzi Scheme) was started in 1991 by one Hadjim Sijdia. This warm-hearted chap offered his depositors a generous 6% per month, and the money flowed in. Success is quickly emulated, and by 1993 a further nine similar pyramids spanning the country were making the population rich.

There must always be a pretext to hide the true nature of a pyramid and to justify the extraordinary returns offered. It seems most investors believed they were themselves the perpetrators of a scam. They were told the profits were made from smuggling and money laundering.

Every investor was becoming wealthy in this new capitalist utopia, and with strong consumer confidence and resulting spending, Albania's economic growth was the highest in Europe in each year from 1993 to 1996.

But a pyramid scheme only survives while it grows. To keep new money coming in, the operators were forced to offer higher and higher returns, eventually reaching 50% per month. In February 1997, when the last Albanian had invested his last lek, the pyramids could no longer pay interest, and promptly collapsed. The Pyramid founders disappeared. A total of US\$1.2 billion was lost, a huge sum for such a small economy, representing a staggering 50% of Albania's gross domestic product..

Readers probably remember what followed. Albania descended into lawless madness. Military bases were looted, 1.5 million weapons and 10.5 billion rounds of ammunition (3,000 rounds for each Albanian) were stolen. In March 1997 a fully automatic Kalashnikov assault rifle could be bought on the street for US\$3, making Albania the holiday destination of choice for budget-conscious One Nation voters.

It couldn't happen here, could it? Australians are so much smarter than those unsophisticated Albanians, aren't we? Readers may recall the sorry saga of an Australian Ponzi scheme operating under the trading name of the Wattle Group (*the Skeptic* 18/2 p 39), where \$155 million was lost to a Queensland scamster offering participants 50% per annum.

The impossibility of that interest rate is self-evident. Had your parents, on the day of your birth, invested just one dollar (ten shillings, as we quaintly called it then) into an investment compounding at 50% per an-

num, what would you be worth today? A reader aged 50 would be worth a lazy \$637 million. The esteemed editor of this fine journal, a grizzled 61, would have \$55 billion to toy with, and would roar past Bill Gates before turning 65. Your first trillion dollars would sweeten your 69th birthday party, and if you were born in 1925 and haven't yet died, your funds would exceed the combined capitalisation of every stock market on Earth. All in one lifetime, and from a single dollar.



The author in pensive mood.

Pokies

Previous columns have detailed a number of investments which are being touted around the traps, and outlined the various reasons why they should be avoided. But the following investment is real, with the numbers extracted from a client's 1999 accounts. If you could lease equipment for \$5,400 per month and receive, in the same month, a pre-tax *cash* profit of \$40,000, would you do it? What is this fabulous investment? Poker machines! No, not playing the wretched things – owning them. Take the following numbers extracted from a NSW country pub's 1999 accounts:

Poker machine takings	782,000
Turnover tax (State)	233,000
Machine lease charges	65,000
Net profit	484,000

A single pub has bled three-quarters of a million dollars from a country town whose main industry is collecting Centrelink cheques. Since mid 1997, when the NSW government legalised pokies in pubs, the value of every NSW pub has doubled. Readers need little imagination to discern the social costs of easy gambling. Don't look down on the Albanians.

Punters

Thanks to the many readers who have forwarded glossy brochures on horse racing computer programs. There are a number of promoters of this silliness, with the cost of the software averaging \$8,000. All the investors need do is tap in details of the afternoon's races, and the computer will then tip the likely winner. Here at Skeptics Central we could spend \$8,000 of our beer money on the software, and then have our computer whiz delve through its code to see what logic it uses. But it isn't necessary. Let's take the Australian Skeptics' first step when confronted by a claim:

Let's pretend it's true. How will the world be different?

Readers may recall the *Fine Cotton* scam of 1984. A group of scamsters (who now carry the scientific name

True meaning of depression

Sydney Bockner

'bungling twits') substituted a fast horse (*Bold Personality*) for an old hayburner named *Fine Cotton*. Poor old *Fine Cotton* could barely trot, and was a 50:1 outsider. But at 2.25pm on Saturday, August 18, 1984, at Eagle Farm in Brisbane, '*Fine Cotton*' miraculously won the 1,500m Second Commerce Novice Handicap and earned prize money of \$5,800. There were a few problems. *Bold Personality* was bay in colour, *Fine Cotton* was brown. So the scamsters tried, unsuccessfully, to use hair dye! *Fine Cotton* had white socks in its hind legs, *Bold Personality* did not. So they sprayed white house paint on its hind legs just before the race! It is hard to imagine a more amateurish substitution, and when the ring-in was immediately detected after the race, the winner was disqualified. A funny thing had started a few hours before the race. The odds on *Fine Cotton* rapidly shortened from 50:1 to even money. Punters around the country, and from as far afield as Fiji and Papua New Guinea, suddenly bet heavily on *Fine Cotton*. The word had got out – *Fine Cotton* is worth a punt.

If clowns like the *Fine Cotton* scamsters can so dramatically shorten the odds on a horse, what will happen when thousands of punters receive the same tip from their computers, and tell all their friends? If we assume the magic software really can pick the winner, its very success will be the thing which renders it worthless. By the time we hit the phones to place our bet, the bet will not be worth making.

Readers are free to disagree with me and spend their beer money turning their computers into \$8,000 poker machines.

Some years ago I met a bright young spark who had just paid \$4,200 for a hand-held computer, programmed to make him rich at the racetrack. The software was simply a Martingale. The Martingale gambling technique involves doubling up for each losing bet. So if your first bet wins, you pocket your free money and leave the racetrack, casino, stock market, or wherever. If your first bet loses, you double the value of your second bet. And so on, until eventually the laws of probability mean you must win.

The logic is seductive, but I will believe it works when the first casino bans its use. Readers of *the Skeptic* are astute enough to see the flaws in the logic.

Wattle update

The Australian Securities and Investments Commission has commenced a criminal prosecution against Geoffrey Dexter, the promoter of the Wattle Group scam mentioned above. On 7 February 2000 the ASIC banned one James Callahan from being a securities dealer or investment adviser. Young Mr Callahan was the person who recommended Wattle to the elderly widow mentioned in previous articles, and has been a focus of my fury for several years. Callahan must have spent a fortune on legal fees, engaging a top QC to defend the ASIC's actions. I was called to give evidence, and spent a torrid time being cross-examined by the QC. These guys earn their exotic fees, and I freely confess his clever questions had me contradicting myself on several occasions. But to no avail, and his client has now experienced an altered career path. A nice win for the good guys, but the money has still gone.



The most widely used term in describing psychological symptoms is probably "depression". That word covers a multitude of conditions, and as a result the serious diagnosis of Endogenous Clinical Depression is frequently missed.

Unfortunately the term depression is used both as a symptom and a clinical diagnosis. As a symptom it signifies simple unhappiness, and is a reaction to stress, or to a psychoneurosis such as an anxiety state. The resulting unhappy mood is known as a Reactive Depression. Unhappy moods are quite normal at times, of course, and do not signify illness.

However, when depression is a *diagnostic entity* it is known as an Endogenous Depression, implying that it originates from *within*, and not from external factors or psychoneurosis. This is a far more serious condition, with a different symptomatology, prognosis, and treatment.

This type of depression responds in most cases to anti-depressant drugs. The reactive type is more effectively treated by psychotherapy. Patients with an endogenous depression often fail to recognize that they are ill. In contrast to the reactive type they do not readily cry, and are more likely to complain of "loss of interest" than depression. The sleep disturbance with early morning awakening, the exacerbation of symptoms in the morning and improvement by evening, and the self-blaming attitude are quite characteristic. Physical symptoms are commonly prominent, which may mislead both the patient and the doctor. Many of these cases are misdiagnosed or untreated, sometimes with fatal results. (16% die by suicide if untreated).

There has been much controversy among psychiatrists whether these two conditions - reactive depression and endogenous depression - are the same illness (Kendall 1976, Mayer-Gross et al 1977). There is some blurring of the differentiation in some cases. But the endogenous type has been shown to be related to chemical (neurotransmitter) changes in the brain. There is little evidence of this in the reactive type.

The first line of treatment in the endogenous depression is drug therapy with antidepressants. They are not tranquillisers, and are non-addictive. This recent advance in psychiatric treatment has saved many lives. Hence the importance of differentiating endogenous depression from reactive unhappiness.

This article is based on a talk given to the South Australian branch of the Australian Skeptics, Skeptics (SA), in Adelaide on February 2nd, 2000.

References and further reading

1. Kendall, R.E. (1976) - "The classification of depression: a review of contemporary confusion". *British Journal of Psychiatry* 129:15-28.
2. Mayer-Gross, W., Slater, E., Roth, M. (1977) - *Clinical Psychiatry* (London) "Differentiation of Endogenous & Reactive Depression", p.209-210.
3. For further reading - an excellent review in *The Mind Machine*, by Colin Blakemore, BBC Books (1991) p.197-208.



Welcome to the non-event

Bob Nixon

We made it. It's the year 2000. Great, isn't it? The doom and gloom merchants have disappeared with their tails between their legs and all is right with the world. It was, frankly, the greatest anti-climax the world has ever seen, with the possible exception of the year 1000. I still have trouble coming to terms with how little actually happened. Apparently there was a computer in Gambia that failed, and the lights went out in part of Melbourne for a few seconds (later attributed to an aluminium coated balloon that was released on the stroke of midnight and made a beeline for power lines).

There's so much to talk about it's hard to know where to start. The Y2K bug, the collapse of civilisation, the return of Christ, the announcement that the New World Order has taken control. None of it happened.

We did see one phenomenon that is worth noting here. As the Big Day approached, the doom and gloomers disappeared. The predictions became less and less strident, there would be fewer tidal waves and earthquakes and the number of UFO's due to overfly the White House dropped dramatically.

It points, I think, to a lack of commitment on the part of the soothsayers. Mark Who Sees With The Eyes And The Wisdom Of The Eagle (known by his mates as Mark Eagle Eyes) was among the loudest of the Australian predictors.

Actually, Mark is an American, although he lives in Sydney. He claims descent from Native Americans and further claims to use their insights into the future. It appears that Mark lost faith in his ancestors' ability to foretell disaster as the year progressed. From providing the people of Australia with tips on where to run to avoid the tidal waves and assorted earth changes that were about to hit, he went to warning against storms and civil uprisings to complete silence.

I first encountered Mark in a magazine called *Golden Age*, wherein I found his initial warnings. I next met him through Nick Kapsis (more of Nick later) and had some correspondence with him. Mark kindly sent me a copy of his book *A complete guide to North American Indian Prophecies*. In that volume can be found his more dire warnings, we are – naturally enough – utterly doomed because we have already offended the Earth and she's about to take action against the infection that is the human race.

Mark's motivation is a little hard to pin down. Certainly his predictions have brought him a degree of notoriety among the readers of one minor New Age magazine, and he's probably made a few dollars from his book of ancient wisdom. One suspects that neither is sufficient for his needs. My own feeling is that he sees himself as very special, with lessons to teach the world. What Mark wants, above fame and money, is disciples. His complete lack of success as a seer will, sadly, be insufficient to deter those looking for a guru and for whom Mark's message makes sense.

The beauty of the sort of predictions Mark makes is that there is constant supporting evidence for them. He predicts, above all, Earth changes and they're easy enough to find support for over just a few months. Think of recent earthquakes, floods, hurricanes or bushfires and you can get an inkling into how it works. Mark simply adds each natural disaster to his kitbag of supporting evidence. It matters not one whit to Mark that such events have been happening since before T-Rex was a mere lizard, nor that they will continue long after Mark has gone to the happy hunting grounds. While Mark's around he can spout his ancient wisdom.

Not that it actually belongs to him, of course. He's merely borrowed from forefathers he claims as his own and a few more besides, then he adds a few apocalyptic predictions from other authors for a touch of mutual support and bingo, he's got a message. A gullible editor gives him a forum and suddenly he's important to a few New Agers.

All very sad really.

Nick Kapsis has suggested to me that I was right when I first warned him about Mark's motives early in 1999. Nick came to us with an idea to run a competition to find Australia's finest psychic. He made no bones about the fact that he fully expected to see himself take the title and even offered a few predictions to start things off.

He predicted that Australia would become a republic by 2000, that a gentleman by the name of Al Gore would be our first president and that Peter Beattie would become the next Prime Minister of Australia. The second of his predictions might surprise some readers who have heard the name before. Mr. Gore is, of course, the Vice President of the United States with ambitions for the top job (which comes with interns, apparently). Nick's thought was that Australia would become a state of the United States. This was to happen not long after New Zealand became one of our states. It's all a bit complex, but it made sense to Nick.

Nick and I worked together on the idea of the competition for a couple of months before he called me one night to announce that there was some sort of alien jigsaw puzzle scattered about the vacant lot across the street from his home. I was aware, because he'd told me, that he suffered from a mental illness, and in the preceding weeks his behaviour was becoming more and more erratic, but this was the final straw. We finished the conversation and the collaboration with his agreement that he would stake his reputation as a psychic on his prediction that aliens would land and make themselves known to the people of the world by 1/1/2000.

We now know that it didn't happen, and I wrote to Nick to remind him of his promise. Experienced Skeptics will not be surprised to learn of his response. He

Continued p 41 ...

Auras to order

Jason de Moiser

It is the year 1984, I was attending the Royal Melbourne Show with my parents and I was just 12 years of age. I stood as an island in a stream of bodies flowing all around me as I tried to identify the familiar faces of my parents. They were nowhere to be seen, swept away by the currents of passing strangers, so I quickly realised the futility of trying to find them and began to peruse the many exhibits and stalls.

I was eventually attracted to a stall that had a large snaking single file of individuals eager to have their auras photographed. "An aura", I thought "what is that?" Approaching the front of the queue, I looked up at a wall adorned with photographic images of people surrounded by blurred multicoloured smears depicted as their so-called auras.

Admittedly at first I was in a state of bewilderment; I was young, I had a thirst for knowledge and this phenomenon, the "aura", was somewhat alien to me. I wanted to know more, so I asked the stall operator what is an aura? In heavily accented English he informed me that it is an energy field in the invisible part of the electromagnetic spectrum that surrounds all living things. Depending on the colour and intensity, it depicts an individual's general state of well being and health.

Well I may have been only 12 years old, but I was certainly not bamboozled by terminology pertaining to the "electromagnetic spectrum", after all since age 10 I had been making my own holograms in the garden shed with a small helium-neon laser which at the time had cost my father a small fortune, so I was familiar with both the electromagnetic spectrum and photography.

I smelt a rat and stood back to scrutinize the operator's actions. What's more I was uneasy with the notion that film sensitised to the visible spectrum could record electromagnetic emissions in the invisible spectrum. Immediately evident was a Polaroid camera, and a console tethered to the camera with what looked like a 50 or 64 way ribbon cable. Back in those days before high speed asynchronous Ethernet data transfer, a big fat ribbon cable like this reeked of computational brute power (designed to impress and validate its cause with the wonders of modern technology no doubt).

"Where is the computer?" I thought. well as I soon found out there was none. As the hopefuls swayed in queue, there was an brief intermission as the aura photographer had to open the camera to replace the exhausted film cartridge. It was then that he exposed his fraud to all.

How it worked : well, the console was merely a jiffy box with four haphazardly positioned toggle switches which activated four incandescent light bulbs, similar to Christmas tree bulbs, strategically placed inside the camera to deliberately overexpose the film. With four different coloured bulbs, the operator could select a possible sixteen combinations of multicolour overexposure. I actually witnessed the stall operator activating

the various coloured bulbs from his console whilst the camera film compartment was wide open for all to see.

Yet the eager punters were oblivious to this charlatan's antique mode of trickery. Filled with disgust by this man's preying on the gullible and due mainly to my sympathy for the victims, I decided to inform them that they were being taken for a ride. After all, way back then he was charging these willing people \$35 a shot for their so called "Aura Photographs". I didn't know the meaning of the word "fraud", but I knew what fraud was.

What a mistake! I confronted the expectant queue of photographic aura subjects and informed them of the deceit to which they were about to subject themselves. Their collective response was a barrage of ridicule and abuse which eventually reduced me to tears. What's more the stall owner approached me and dragged me aside, his angry words remain permanently etched in my mind. He said "listen you f*cking smart-a*se, stop causing me shi*. If you continue to annoy my customers I will kick you up the *rse so hard that your nose will bleed".

Remember, I was just 12 years old. I took a stand, only because I saw my fellow humans being bled by a profiteering charlatan assuming the guise of a supernatural informer. I only wanted to convey the truth, but the people did not want to hear it. They yearned to remain ignorant: as they say "Ignorance is bliss".



... Non event from p 40

refuses to admit defeat, claiming that he requires three more years before he will concede that aliens did not land in 1999. What he's done is forget the phrase "and make themselves known". To admit defeat would mean conceding that he does not have psychic powers and that his belief is the result of his mental condition – a possibility he canvassed earlier in the year.

Nick, unlike Mark, is looking for nothing other than a degree of self-awareness, but he's hampered by a condition that is capable of treatment. For reasons of his own he chooses to forego that treatment in favour of the delusion that he possesses special abilities.

Nick, it has to be said, was very difficult to work with, particularly so towards the end of our contact, but I look back on that contact fondly. Here is a young man with serious delusions, but a desire to explore that part of the human experience that interests him. Mark sought only to exploit those people who were attempting to explore much the same experience.



More musings of an innocent abroad

Barry Williams

When last heard from our intrepid travellers had survived the rigours of London and Cambridge, and were heading off into the uncharted wilds of the British hinterland. For further impressions, read on.

The East Anglian city of Ely, dominated by a truly impressive cathedral. Somewhat nonplussed to see that the lawn of this house of God sports a large cannon (of the artillery, rather than ecclesiastical variety), but all becomes clear when we learn that the home of Oliver Cromwell lies only a couple of hundred metres away in the direction in which the gun is aimed.

A night in Wakefield, a town sadly deficient in visible vicars. Across Yorkshire through towns whose names resonate from our distant schooldays - the industrial heart of the Empire (for some reason "jute" sticks in memory). Duesbury, distinguished not only for being the birthplace of NSW Skeptic and prominent prestidigitator, Steve Walker, but also as the home of the late bandmaster on the *Titanic*. The latter fact is recorded on a little blue plaque, though, strangely, the former is not.

Excursion base, a rented cottage in the improbably named village of Giggleswick, sports a sign indicating it was already 99 years old when the First Fleet dropped anchor in Botany Bay.

Ranging around the north of England, one fact is brought home; while stone walls may or may not be a prison make, without them everything north of Birmingham would be one giant sheep station. It is hard to comprehend just how much labour has been expended on the construction of the thousands of kilometres of dry-stone walls that cut this country up into small parcels.

An illusion that fails to survive the cold hard light of Skeptical scrutiny; a visit to Ilkley Moor without a hat does not necessarily result in catching one's death of cold, subsequently to be consumed by worms, thence ducks and so on up the food chain. Mother Shipton's (the Nostradamus of Yorkshire) Cave is a disappointment and priced far higher than more legitimate historical attractions.

A new appreciation of the importance of Henry VIII to English heritage; the dissolution of the monasteries led to some very spectacular ruins. Rievaulx Abbey, rural North Yorkshire, surrounded by lush woodland, soft rain falling and mist curling around the wall shells. Almost enough to encourage the assumption of holy orders. Those 12th Century Cistercians knew something

that modern real estate agents have only recently learned - with property there are only three important factors - position, position, position.

A visit to Haworth, Bronte country, to learn that in the time of the literary sisters this part of Yorkshire had a death-rate from disease only matched in the worst parts of London. As the village street is on a precipitous slope, and cobbled at that, we assume that the rate of compound fractures was also of record proportions. Passing a picturesque cottage with a service van from a well-known appliance manufacturer parked in front, we are certain we hear the driver say to the occupant "Ee oop, trooble wi' cooker?" but our travelling companion denies it.

A personal thrill while visiting the Stephen Joseph Theatre in Scarborough to see an Alan Ayckbourn play, directed by Alan Ayckbourn, is having a beer and chat in the bar afterwards with Sir (as he had recently become) Alan himself. Ayckbourn now has the distinction

of being more frequently produced worldwide than Shakespeare, the first English playwright since the time of Bard himself to achieve this.

Onward and upward and as we approach the border with Scotland we notice the increasing presence of the English (the red cross of St George) as opposed to the Union flag (the bit they pinched from the top corner of ours) which is pre-eminent in the south. This impres-

sion is strengthened later when we approach Wales. Is the United Kingdom in danger of becoming the Untied Kingdom?

Edinburgh and the famous Forth Bridge make little impression, being engulfed in downpour - must be the monsoon season. Up the centre of Scotland pausing in Huntley to visit Huntley Castle, ancestral home of the clan Gordon. Of one prominent member, either George, the Lord Byron, or Richard, the Lord of NSW Skeptics, it was said he was "mad, bad and dangerous to know". Seems appropriate in either case.

To Dufftown, heart of malt whisky country; a whisky shop in the main street sells nothing else. Is it imagination or does everything really have blurry outlines? On the outskirts a small bridge built by Thomas Telford, the great Scottish engineer from the early days of the Industrial Revolution. We will see much more of his work in other parts.

The windswept field of Culloden brings a feeling of intense melancholy. There stood a trained army with



Rievaulx Abbey

artillery and there stood ill-equipped Highlanders - only a couple of hundred metres apart. Small stone memorials mark where whole clans were wiped out. Sad.

In Inverness we see our first man in a kilt. We had thought we saw one earlier in Edinburgh, but on closer inspection it proved to be a Buddhist monk in a saffron robe (the McLama tartan?). Inverness sits at the entrance to the Great Glen that divides the Highlands from the Lowlands, at the point where Loch Ness enters the sea.

Loch Ness, legendary home of mythical monsters - a must for any Skeptical traveller. A curious (dare I say paranormal?) thing happens. The video camera, which had hitherto faithfully recorded our travels (or, too often, the interior of the camera bag) refuses to record Loch Ness. Are Nessie or small grey aliens beaming EUTS to prevent exposure? Are the CIA, MI5, NASA, ASIO, or the NRMA covertly interfering with the equipment? Who can tell? Despite this ominous omen we press on and utterly fail to see any trace of untoward fauna. But what mysterious force exercised its malign influence on our camera? Following the rule espoused by all technological sophisticates, "when all else fails, read the manual" we discover that what we need is to clean the recording heads. Fort William is not exactly the epicentre of the white hot information revolution, nevertheless a head cleaning tape is found and the camera once again works as per specifications. Alas! Another myth falls to a rational explanation.

Hereabouts the aforementioned Telford completed one of his great engineering works, the connection of all the lochs of the Great Glen to form the Caledonian Canal. He built locks to join the lochs, which must have caused some linguistic confusion.

To Skye, the isle famed in story and song. This island is now joined to the mainland by a bridge about the same length as Sydney's. The toll approaches \$15, *each way*. Where is Flora MacDonald and her bonnie boat, now that she's needed?

Through the village of Glencoe, scene of ancient Caledonian chicanery, where the Campbells massacred the MacDonalds. It seems to have worked because there are still no MacDonalds to be found in the village (nor any other multinational fast food outlets, for that matter).

Now comes the chance to complete a quest that had its genesis in *the Skeptic* (11:4) *Letters* column. Corre-

spondence had been exchanged between the editor and Dr H H Macey of Perth regarding the meaning of the word "fiunary".

It had been ascertained that a village of that name was to be found on the shores of the Sound of Mull. Travel down a very low class rutted road leads to the Fiunary Camping Site. And that's it. No village, no hamlet, nothing but a caravan park, and a very small one at that. Could Fiunary be another Brigadoon, appearing only once every century? And we still

don't know what a Mull sounds like.

Scotland is a lovely place which contains some very rugged bottom halves of mountains - we can only assume they also had peaks, though we never saw any as they were always shrouded in mist. We can, however, confirm that one popular belief is true - Scotch mist is no myth (try saying that quickly after an afternoon in Dufftown). Stand still in Scotland and you will get wet, even when it's not raining.

Alas, we must leave Scotland, pausing on the way to visit Hadrian's wall. This edifice, built by the eponymous Roman emperor for the sole purpose of keeping the wild and hairy Scots and Picts out of the civilised parts of the Empire, was a signal failure. The only time we hear bagpipes on our journey is in Carlisle, on the *English* side of the frontier.

While exploring one of the wall forts, we are passed by a large train load of coal heading eastwards. Our travelling companion observes that it must be taking coals to Newcastle, and of course she is right. Which brings to mind another curious fact. We have always been aware that Newcastle, NSW took its name from Newcastle-on-Tyne in England, but this is the first time we become conscious that the Australian city's suburb of Wallsend refers to the end of *Hadrian's Wall*.

Drive through that part of England and you would swear you were in the Hunter Valley (or *vice versa*) - Lambton, Wickham, Morpeth, Hexham - the names are all the same.

But here we must draw these reminiscences to a close for now. In the next episode we will dine with some Skeptics in Manchester, visit *Hen Wlad Fy Nhadau* to discover if they really are keeping a welcome for us in the valleys, explore the mysteries of crop circles in wildest Wiltshire, hang around a henge and experience an antipodean reunion in Richard Dawkins' back garden.



Urquhart Castle on the shore of monsterless Loch Ness.



Fiunary. Futile end to a long pilgrimage.

Michael Shermer: Skeptics Society

Richard Cadena

This article is the third in a series of four interviews I conducted early in 1999 while visiting in the US. Previously (Skeptic 19:3), Bob Carroll <www.skeptdic.com> was interviewed, and Bob Steiner (Skeptic 19:4). The future interview will be with James Randi (Founder and Director of the James Randi Educational Foundation).

Michael Shermer is the founding publisher of *Skeptic* magazine, the director of the Skeptics Society, the host of the Skeptics lecture series at the California Institute of Technology, a professor of the History of Science at Occidental College, the host of his own national public radio show called *Science Talk* (with over a quarter of a million listeners) and the author of the best-selling books *Why People Believe Weird Things* and *How We Believe: The Search for God in an Age of Science* (W.H. FREEMAN).

Skeptic magazine has an international circulation of 40,000 and his books have already been translated into seven different languages.

Dr Shermer has a BA in Psychology / Biology, a MA in Experimental Psychology / Evolution of Behavior and a PhD in the History of Science. He has also written many books on cycling based on a 10-year professional career as an ultra-marathon cyclist and competitor in the 3,000-mile, non-stop, transcontinental Race Across America.

I found Michael Shermer, who is in his mid-forties, to be a wonderful spokesman for skepticism. The work he has done in past ten years is truly inspirational. There is no doubt that he will be a leading light of skepticism in the years ahead.

Richard Cadena: Michael, I'd like to get your thoughts about one other person I will be interviewing. James Randi?

Michael Shermer: *Randi? Randi? Why do I know that name? (laughs) Well, Randi is the man. He is the skeptical movement. As far as I'm concerned, he is the fountainhead of the whole thing. More than anybody else he is an activist and it is hard to be an activist. Plenty of people are intellectuals about it, but Randi is actually out there in the trenches. That is what he does best. I think there is a good division of labour between his group and our group. He is great at getting out there and testing a lot of these people but he doesn't publish much, we do that. There is a nice blending; we work together on that. It will be a sad day when Randi is gone. The entire second half of the twentieth century he has really held down the skeptical fort and been the voice of reason. We need more people like that.*

RC: How did you meet him?

MS: *I'd been reading Randi's stuff for quite a while back in the 70's. When Geller got hot, that is when I got interested in*

all this paranormal stuff. I was a graduate student in experimental psychology. All these magazines were saying Geller was the real thing. These experimental psychologists tested him and said he was for real. I thought, "Wow, maybe there is something to this". Then Randi's stuff came out and it was "Oh, you can do this with magic tricks." Ever since I've been following Randi's work. So when the Skeptics Society started he was our first choice to be our first speaker and help us get started. Which he did. He was great.

RC: He writes articles for the *Skeptic* magazine?

MS: *He writes a regular column for us called " 'Twas Brillig...". A lot of articles in Skeptic are scholarly and deal with mainstream scientific controversies or religion but we have to keep in touch with the paranormal stuff and that is what Randi does best. People like Randi's column. He also comes out every year for our annual conference.*

RC: How did the Skeptic Society get started?

MS: *Late in 1991 was when I met Pat Linse [RC: Managing Editor and Art Director of Skeptic Magazine, who is brilliant], who is a graphic artist, and we started forming the ideas of the Society. March of 1992 was when the Skeptics society had its launch with Randi. The first issue of Skeptic came out in June of 1992. Randi was going to be on the cover but then Asimov died so Randi had to wait. Fortunately, Randi is still with us.*

RC: How did you personally get involved in skepticism?

MS: *I'm a fairly open-minded guy and like most people (eg, X-file fans) the paranormal is interesting, titillating and fun. There are mysteries we can't explain that are intriguing. When I was racing bikes, I tried a lot of alternate medicines and performance enhancing things. So much of that is bullshit. It is hard to tell with a subject pool of one. (laughs)*

My degrees are in experimental psychology and history of science. What we are doing at Skeptic magazine and the Society is science. It is just that our area of research is on the margins of science. The boundaries between science and pseudoscience, history and pseudohistory, the normal and the paranormal.

RC: You have a radio program in the Los Angeles area. Are there other media shows that you do?

MS: *We do media stuff almost everyday. Good Morning America, Extra! and others. I am the producing consultant and co-host (with X-Files' Mitch Pileggi) of a series on the Fox Family channel called Exploring the Unknown. We present the paranormal side fairly and allow these people to have their say, but then, unlike other shows, when we say*

"You be the judge" at the end, the viewer will have been given the complete picture of what science knows about the subject.

RC: Is that because you know people?

MS: No, it is feedback loop. It is a cumulative thing. You get in people Rolodexes. Producers have to call people as their talking heads for various subjects they do stories on. The explosion came when my book came out (*Why People Believe Weird Things*) in May of 1997. My publisher sent me on a huge national book tour and that put me on people's radar screens and in their Rolodexes. I had done Oprah, Donohue and most of the major shows but after the book the calls really started to come in.

RC: Something that happens frequently is that they interview both sides and then show only a tiny bit of the Skeptic or none at all. Have you experienced this?

MS: Yes, there is definitely a screening process there. I am a lot more selective than I used to be about which shows I will do.

RC: How do you find working in Los Angeles?

MS: It is better to be located in a major city, like Los Angeles, for media reasons. I am able to go to television studios and do interviews about a half-hour drive from my house. In a small city it would be harder to do those kinds of things. We have the advantage of being in a huge market. In terms of our lecture series, it helps to be in a market where you can draw more people. Southern California is a hotbed of weirdness anyway.

RC: Yes, I was going to ask you about LA's image of ...

MS: La La land?

RC: Yes. I went to Venice Beach and saw all the New Age stalls on the beach offering readings and healing crystals. How do you find you are viewed in LA given the reputation?

MS: We are well received. I've gotten calls from Jet Propulsion Laboratories (part of NASA) where they were getting protestors over the Cassini project. [The Cassini probe is powered by nuclear energy] The protestors were saying that Nostradamus had predicted that Cassini would crash into the earth. So, JPL called up wanting to know the skinny on Nostradamus. People at CalTech get calls all the time from people with perpetual motion machines or a new theory of physics that proves Einstein is wrong. So they ask us to

take care of these people. That is what we do, we are taking care of the people on the fringes of science.

RC: Given the rise in pseudoscience over the past few decades, how do you avoid getting frustrated?

MS: It is not going to go away and it is what we do for a living. It depends on how you look at the statistics. Yes, it has been on the rise in the last few decades but if you compare it to four or five hundred years ago, things are much better than they used to be. By contrast, the fact that we live in the age of science, that is what makes it surprise. How anyone living in the late 20th century can believe it; you could understand it five hundred years ago but not now.

On one level it is frustrating but on another level that is what I do for a living so it is "Thank you for all the weirdness".

Actually the **most** frustrating part is the media and how they feed pseudoscience. They deliberately deceive their viewers. You can call it lying. That is what it is. They do this in order to get ratings. I know plenty of producers who will freely admit that they put someone on TV who they knew was a phoney but it made a good show. What they are saying is "We are willing to lie to the public, if we can make money out of it".

So they are really no different than the scam artists they are putting on. To me that is flabbergasting. It is one thing if you are curious and trying to figure out what is going on. But when they knowingly put someone on the show who is deceiving or they participate in it, this is immoral.

Like this James van Praagh, I've been following for years. [Van Praagh claims to be able to speak with the dead] Plenty of producers have given him information about guests. Sometimes he is so good at it that they don't realise they are giving him information, but other times he will blatantly ask, "will you tell me who died" so he can do better. OK, it was the grandfather. "And what did he do?" He was a fireman. "OK, thanks." Then on the show, it's "I'm getting the spirit, he is wearing a uniform" etc. It is a deceit. The viewer thinks, "Wow, that is incredible, how did he get that?" Well the producer told him! That is how he got it. So, that is my job, to explain it.

RC: I notice that you, more than other Skeptics, discuss God?

MS: Religion is a tricky thing. Our territory is if the claim is testable or examinable, like the Shroud of Turin or the earth is 6000-10000 years old. But when you get into things like proving God through Aquinas's arguments for 'First Cause',



Michael Shermer and friend

'Prime Mover', that is not science that is philosophy. So there it is a little greyer but it is still examinable.

When people say they believe because it is true and they can prove it, even if it is a philosophical proof, that is fair game. The other aspect of religion that is our turf is anthropology, sociology and psychology of religion. These are legitimate fields of study. The question is "Why do people believe in God?" Well that is the subject of my latest book, *How We Believe: The Search for God in an Age of Science*. That is a legitimate question. What is the role of religion and why is religion so powerful? That is no different from asking "Why is pseudoscience so popular?" Those are socio-logical and historical questions. Because I was writing this book, my focus was on religion. My interest will change to whatever my next project is, which is "Why we are moral", about the evolution of morality and humanistic ethics.

RC: I notice that you have debated God, not the actual being, but the supposed agent on Earth. How did that go?

MS: The question was "Does God exist?" There were seven different points my debate opponent had. Prime Mover, First Cause, universe is designed, you can't be moral without god, Jesus rose from the dead, which could only happen if there was a god. He dismisses that maybe the story got exaggerated, the resurrection theme is a common one in myths. But no, it was real. He also had a weird one that humans have dignity and pride, which no other animal has that therefore it came from god. These were all easily refutable.

RC: Obviously, you had your own points to raise. What were they?

MS: The question, "Does God exist?", cannot be answered scientifically or rationally at all. It is an unknowable in Huxley's original meaning of the term agnosticism. Given that we can't prove it one way or the other, what do we know? We know that it sure looks like a human construction. It is culturally bound. The type of god you believe in is very much determined by your upbringing, the culture you were raised in, the historical period, and so on. It is clearly and obviously constructed by humans.

Start with the Bible. In the first chapter there are two different creation stories. I don't know what it could possibly mean to read the Bible literally in order to prove something. How could there be two creation stories? The answer is that it is an edited volume written by humans. If you want to say that religion is important, I agree. It is a personal faith thing, fine. But just don't try to prove it. Don't try to convince me that you have the one true right and only religion and you can prove it. You can't.

RC: Switching away from religion, if you could somehow eliminate one of the streams of pseudoscience, which one would you eliminate?

MS: (pauses for moment) I don't think I can answer that specifically, I would answer it generally. Superstition is the problem; it is human thinking gone wrong. Any one stream is just an example of an underlying problem with the belief engine and how it works. That we are capable of learning and doing science also means we are capable of mislearning and doing pseudoscience. I not sure you can disentangle them.

The fact that you learn means you connect this event with that event. Well, sometimes they really are connected and sometimes they are not. The only way to find out is to use reason and science. It could be that it is inevitable we will have superstitions with us.

I don't think getting rid of any one stream would make any difference at all. They are going to keep popping up. If you could erase the record and start all over with a group of humans on an isolated planet, they would create gods, religions and the paranormal would arise in various forms.

RC: To get at that question in a slightly differently way, which stream do you think does the most harm?

MS: Extremist religions, particularly when tethered to state power, historically. The Inquisition was potent because it had the backing of the state. Religion by itself is not that bad. It is not good or bad it just is. There are plenty of good things in religion. But when they have the sanction of state power then they can do serious damage.

Hitler's program of eugenics is a parallel secular example. Eugenics by itself is not bad; it is when you link it to state power. If you want to set up a eugenics program where you have a private foundation that gives people money to alter their genes or only breed with people with an IQ of over 120; you probably aren't going to be in business long. In a free market, there aren't too many who will do this. Some will, fine but if the state implements this that is when it gets dangerous. The other aspect is the extremists that take violent action, like the group of Christians that went to Jerusalem to kill Arabs and Jews in order to bring about the Second Coming.

RC: Before we end, I'd like to ask if you have ever been to Australia?

MS: Yes, in 1986. For one month on a biotour with a professor friend of mine. I was lecturing on Darwin and natural history. My friend, who is a naturalist, along with a local naturalist, and I were in Queensland. However, I've never done any skeptical work there.

RC: We have an annual conference hosted by the Australian Skeptics. In 2000, we are combining the annual Australian Skeptics conference with the World Conference in Sydney.

MS: Is that sponsored by CSICOP?

RC: The Sydney one is co-sponsored by them, but normally it is just us.

MS: My speaking in 2000 is less likely to happen because CSICOP sort of see us as a rival group. They would probably rather not give me a platform. Something they are paying for, I kind of understand that (laughing). They have sort of a mercantilist, win-lose, model of economics. For every subscription Skeptic gets that is one less for Skeptical Inquirer. I don't believe that at all.

RC: Really? I would think it is the opposite. It isn't like we are awash in skeptical sources. In fact, I subscribe to both myself.

Blatant Plug

A worthwhile service

Barry Williams

MS: It is the opposite. This is a funny sequence of events. When the Stossel program [a special program shown nationally in the US that was very skeptical in orientation] was about to air, apparently John Stossel had interviewed Joe Nickell [CSICOP Senior Researcher] and prior to the show their Internet site said he was going to be featured on the show. Well, that spot was not aired. They were not even mentioned. Skeptic magazine was mentioned, boom, boom, boom. It was great. The phone was ringing off the hook. We got hundreds and hundreds of subscribers in one week. Then CSICOP posted that they were getting calls and people were subscribing. Of course they were. If some viewer sees the show and looks on the web for skeptics, they see Skeptical Inquirer and think, "That was it". We get calls from people who say, "I saw this Joe Nickell guy and I want to subscribe to your magazine" They must get calls for us. "I saw Shermer and I want to subscribe." Sure, sign up. To me, we bring new people in. They benefit from us and we benefit from them. It is a win-win situation all the way around.

[Note: Michael Shermer was recently listed by CSICOP as one of the 20 Most Outstanding Skeptics of the Century.]

Richard Cadena: Well, I certainly hope you can come to Australia because you have done a great job promoting skepticism and setting up the Skeptic Society. Thank you for your time.

Michael Shermer: Thank you, that would be great and I'd love to. I'd love to come to a conference.

Copies of Michael Shermer's books, *How We Believe* (\$36.95) and *Why People Believe Weird Things* (\$24.95) are available by writing to:
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When we become aware of a product or service that we think will be of interest to our readers, we like to give them a mention in *the Skeptic*, and this is the case with BiblioQuest International.

What do you do if you are a bookworm (and many of our readers seem to be) and you want to find a book that is out of print? You can haunt second-hand bookshops and fetes, or make an extended trip to the Welsh/English town of Hay-on-Wye, in the hope that you might pick up a copy, but that is a pretty time consuming and haphazard way of going about it.

Recently I was looking for a number of books, including a couple of novels by a Canadian author which were published in Canada in the 1980s. Our friends at Abbey's Bookshop told me are now out of print, but they gave me a brochure for BiblioQuest International, a book search service. Being the sort of obsessive who just has to get hold of what he has set his heart on, particularly if it is a book, I decided to try them out. Within a few days, BQI had tracked down several of copies of each book, in Australia, Canada, South Africa and the UK, and quoted me prices for each. I placed some orders and have since received all except one of the books, with this one on its way. Most satisfactory.

A book search costs \$10 (3 for \$20). but this is refundable if you buy the book. The books I bought, all hardcovers, cost me about the same as a similar new book published now, but of course this would depend largely on the rarity of the book requested. The service saves you the trouble of searching, arranging foreign currency, postage, etc, and while this would probably be expensive if all you are looking for a potboiler or airport novel, for the true bookworm it's well worth the money.

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Lost civilisations

Peter Hiscock & Mark Newbrook

Lost Civilisations of the Stone Age, Rudgley, R. Century (London), 1998

Atlantis, Lemuria and other fabled early civilisations are the bread and butter of many non-professional archaeologists writing about antiquity; and any book claiming to describe the 'lost civilisations' is bound to make money. However the strength of an argument is not simply measured by its sales potential (as the work of Erich von Daniken demonstrates). In this case Richard Rudgley's ability to identify those lost civilisations is based largely on a language confusion involving the definition of a 'civilisation'. This foundation is particularly ironic given the emphasis he lays on linguistic information in developing his arguments (see below).

Archaeologists and historians have a very specific usage for the term *civilisation* as a designation of a particular phase in human development. For example, in the middle of C20 the greatest of archaeologists, the Australian Gordon Childe, required many characteristics of a civilisation: cities, centralised authority (ie state organisation) capable of levying tax, monumental public works, writing, predictive sciences, craft specialisation, social stratification, political membership based on citizenship rather than kinship, and long distance trade networks. Today it is the first two of these criteria that are emphasised: civilisations are state political organisations with sufficient population size and economic power to sustain an urban component of city size. Intriguingly it is not these characteristics that RR focuses on, but the possession of rudimentary writing systems, surgery, mining, use of fire, symbolism, and other qualities. Many of these (writing systems are perhaps the main exception) reflect those basic qualities in common to all societies we know of, and merely reveal that the remains he is discussing were created by humans. This basic premise to his exposition of 'lost civilisations' is hidden by RR's failure to discuss or even define what a civilization actually is. In the absence of any coherent definition of *civilization* he falls into the trap of using it to mean 'civility' as in the common use of the term *civilized act*, or else to mean that the people concerned were knowledgeable. Not surprisingly, he is able to make a case that some humans in the distant past were capable of artistic, medical and economic activities. We know that *homo sapiens* is a clever species of animal; that is not what we mean by a group having a 'civilisation'!

In fact, RR seems so determined to assert that 'civilisations' existed in the very remote past that in places he is willing to modify definitions until he gets the analysis he wants. On p 34 he can be read without strain as saying just this.

Like many fringe writers RR justifies his ideas with attacks on scientific viewpoints, laced with illustrations of wrong interpretations by academics working 150

years ago, rather than the presentation of unambiguous evidence and well constructed models. He even includes (pp 1-4) some *ad hominem* attacks on the morality of C19 anthropologists; while any such immorality is deplorable, the relevance of all this to current mainstream ideas is rather indirect.

Next, on pp 5-6, RR also adopts a rather 'trendily' New Age/postmodernist and indeed relativist stance, quoting the arch-relativist Paul Feyerabend and suggesting that traditional belief systems and even magic are just as valid as science. He even adduces, as one reason for thinking this, the fact that many supposedly well-educated 'westerners' still accept belief systems such as astrology - though scientists and skeptics would surely count this as evidence of the intellectual confusion in such people's minds rather than of the possible validity of these beliefs. It is typical of such authors that RR nevertheless goes on to rely, in the body of the book, on what he presents as scientific evidence. But many of his 'expert' sources are themselves less than impressive: on pp 13-14 he treats Graham Hancock (the chief of the 'New von Danikens') as an authority on Egyptology! Overall, it must be said that - while the conclusion that our ancestors had an interesting and complex social life is itself hardly a revolutionary finding - RR's own basis for even this conclusion involves accepting many bizarre and contentious interpretations.

The book develops arguments about the past cultural life of ancient Europeans, and dwells on issues of religion and ideology. The work of Marija Gimbutas is central to RR's arguments, and the idea of a prehistoric theology involving goddesses and a harmonious social order is said to be verified by archaeological material such as figurines of women. Unfortunately RR is drawing here upon the work of other researchers with extremely dubious ideas. Indeed, much of what he relies on is now described, even by overtly feminist archaeologists, as 'New Age gynocentric, mythologized interpretations of the past', and owes more to our current social concerns than how figurines were used in antiquity (see Lynn Meskell "Goddesses, Gimbutas and 'New Age' archaeology". *Antiquity* 69 (1995):74-86).

RR's claims for 'pre-writing' are based on equally unstable archaeological ground. Every piece of art showing non-figurative or stylized motifs, such as a pendant, becomes a 'tablet' containing evidence for the emergence of writing systems. It is rather telling that many of the famous archaeologists he cites, such as Flinders Petrie (d.1942) or Gordon Childe (d.1957), have been dead rather a long time; but clearly modern interpretations do not suit his purpose. Even when referring to modern scholars such as Paul Bahn and Peter Ucko, some of whose ideas can be adduced in support of parts of his position, he is highly selective and in places misleading. There are in fact libraries full of archaeological and linguistic evidence, and indeed modern interpre-

tation - to which RR does not refer. Any informed reader should ask why.

RR also relies heavily on interpretations of scratches on pieces of limestone or bone, using the conclusions of writers such as Alexander Marshack. The idea is that these scratches indicate complex understanding of the world, calendrical systems and the like. While it would hardly be surprising that hunters sleeping under the night sky might work out the lunar cycle, these interpretations are particularly tricky - which scratch is counted and which is not, what are the scratches representing, how much knowledge is required to understand seasonal cycles etc? The same questions apply to RR's discussions of ancient use of fire or of medical treatments, or any number of other examples he offers. We must accept that our ancient ancestors had rich lives rather unlike our own, but this is neither mysterious nor hidden from us; and most certainly does not mean that every human who ever painted or spoke belonged to a civilisation.

Most non-standard accounts of ancient history are 'diffusionist', involving the spreading of cultural traits, linguistic features and technological innovations (regarded in the mainstream as independent local developments) from common centres, now unrecognised or even vanished (as in the case of Atlantis). The real facts are, of course, complex, involving both diffusion (from less spectacular/speculative sources) and independent local developments which are sometimes, to a degree, parallel; a judicious analyst (such as, say, Colin Renfrew, on whom see below) would allow for both, as the evidence in each case suggested. Unfortunately, RR - driven as he apparently is by the desire to be iconoclastic - does not so much present a reasoned synthesis as a confused pattern of vacillation between the two positions, not always even appearing aware that his arguments point in opposing directions. For instance, on p 100 he upholds Boris Frolov's ideas about the common origin of certain astronomical ideas as an instance of wide diffusion at a surprisingly early date convenient to his general case; but immediately afterwards (pp 100-104), he rehashes Marshack's partly anti-diffusionist analysis of similar matters, presumably because he wishes to claim priority for European areas previously held to have been the recipients of knowledge diffused from Asia. He makes no attempt to reconcile or synthesise these near-contrary proposals.

The predisposition to 'slippery-slope' logic, in arguments that over-extend inferences far beyond what is reasonable, characterises this book, and we can illustrate this further with some comments on RR's interpretations, focusing in particular on his discussion of language.

RR devotes much space (chapters 2-5 and various passages elsewhere) to his interpretation of the rather scanty and equivocal evidence surrounding

- a) the origins of written language; and
- b) linguistic prehistory and the 'deep-time' relationships between language families. In these respects he makes extensive reference to earlier scholars whose work is at the least controversial and in some cases even 'fringe' in nature. The best known such scholar is Gimbutas, already mentioned above. RR treats Gimbutas as a major authority; but, to most

linguists, her discussions of 'meta-language', 'alphabets of the metaphysical', 'feminine' vs 'masculine' scripts, etc (rehearsed by RR on pp 72-73, 77, etc) appear obscure and tendentious.

More specifically: on pp 64-71 (especially 69-70), RR cites Gimbutas, Harald Haarmann and others on the apparent parallelisms between the various syllabic scripts of the Mediterranean and 'Old European script'. However, given the simplicity of the symbols and the fact that some of the scripts remain wholly or partly undeciphered it would be unwise to join him in embracing specific theories of their origins and relationships. RR's attempt (p 79, etc) to defuse this kind of objection is unconvincing; it leaves us with nothing more than undemonstrated possibilities. Indeed, he confuses the issue of how many geometrically simple character-forms are possible in principle with that of how many such forms unconnected human groups might invent independently; he apparently holds that a degree of overlap between systems suggests strongly that they have a common origin or at least have experienced contact, even in cases where the shared forms are so simple (eg, a cross) that they are among a set of possible forms which is inevitably very small, and are thus almost certain to be shared. It must be remembered that in the cases in question at least some of the scripts remain undeciphered, so that RR's equation of symbols from different scripts must rely upon their forms alone.

This is not to deny that some of the specific issues discussed by RR are interesting and indeed mysterious. In chapter 4 (pp 58-71) he rehearses a number of cases where scripts (or, more likely, pre-script systems) await decipherment and where it is quite possible that our current views on the sequence and significance of events may meet with serious challenges. These include the Tartaria and Turdas tablets from Transylvania (studied by N. Vlassa and others), the artefacts of the Vinca cultural area in Serbia (studied, notably, by Shan Winn), and isolated objects from Bulgaria such as the Gradescica Plaque and the much-discussed (and variously interpreted) Karanovo Seal. Some of these items bear symbols which are similar across the various sites; they have also been compared with symbols on artefacts from Sumeria and other Mesopotamian cultures (although RR, who is here in an anti-diffusionist phase, does not favour such links). But, as we have noted, the problem of the simplicity of the signs - and of the ensuing great likelihood of chance similarity - arises repeatedly in RR's work, and these specific identifications are, predictably, highly questionable. Much is **conceivable** - but little or nothing here is sufficiently well supported for us to deem it **probable**.

Denise Schmandt-Besserat's work on pre-script token systems and the possible development out of them of scripts proper deals with some of this material. It is more sober than Gimbutas' contribution and may well prove to be partly correct; but RR is still too ready to accept all of these ideas as essentially confirmed (pp 49-57).

In chapter 4, in fact, it is not even clear whether RR perceives 'Old European' as predominantly a script or a language family (note his odd use of the term *non-Indo-European script* on p 70; Indo-European is a language family, not a set of scripts); but the two are

very different things: two closely related languages may be written in unrelated scripts, and *vice versa*. (On p 69 RR again seems to confuse languages and scripts, or at least not to write of such things with sufficient clarity.) Furthermore: if 'Old European' is indeed a language family, it is not made clear how it is supposed to relate to Indo-European or indeed to other known languages.

In a similar vein, RR at times seems to equate alphabetic writing, specifically, with writing *per se*. It should be stressed that alphabets (writing systems where each character ideally represents a phoneme) appear to be a relatively late invention. Prior to about 3,500 BP, they are hardly encountered; earlier scripts are logographic (characters represent words/morphemes, as in both ancient and modern Chinese), syllabic (characters represent syllables, as in the Aegean 'Linear' scripts or Japanese kana) or mixed systems where the phonemics, if represented, are by no means the only factor. On p 55, however, RR seems to suggest that, once writers have moved on from pre-linguistic ideograms (eg, symbols representing fixed quantities of known substances) to symbols (of any kind?) representing abstract numerals, they are on the verge of developing 'phonetic' writing (he presumably means 'phonemic'); but what of the non-phonological writing systems just mentioned? Then, on p 77, RR quotes the Delluc as reporting Andre Leroi-Gourhan's view that the cave-painters of Lascaux 'had come close to an alphabet'; but this surely incorporates the same error. And in his discussion on pp 64-71 RR again fails to display sufficient linguistic expertise: he ignores the question of script-type, nonchalantly comparing the Aegean 'Linear' syllabaries not only with undeciphered scripts (or pre-script systems) but also with hieroglyphs and other scripts known to be non-syllabic in nature. Equation of symbols belonging to such varied systems must be done with great caution and preferably in the light of strong evidence.

On p 80, RR quotes Paul Bouissac (following Gimbutas) on the development of scripts out of pre-linguistic representational systems; but the focus here appears to be on distinctions involving the semiotics in general terms rather than on the question of whether or not symbol systems count as scripts. The main distinction discussed by RR and his sources in this context involves the degree of arbitrariness, which is said to be higher (the 'stronger hypothesis') in systems which are closer to true scripts. However, the really central issue here is whether or not an alleged script represents a specific language. (RR seems to ignore this issue on p 84, when he attempts to redefine the term *writing* to include pre-/non-linguistic systems of representation - much as Afrocentrist authors such as Molefi Kete Asante have done when considering traditional African symbol systems. Vague claims about Gimbutas-style 'meta-languages' are not adequate in this context.) Even if a script does represent a specific language, it may still be highly non-arbitrary in character, at least in part; note the pictographic elements in Egyptian hieroglyphs and (especially early) Chinese logograms. This whole discussion seems somewhat confused and unduly associated with Gimbutas' specific semiotic theories.

RR also seems to lay undue emphasis on the idea that writing, like other central aspects of human culture, is implausibly alleged to have appeared very

suddenly (p 101). He may be attacking something of a 'straw man' here. Another 'straw man' (pp 83-84) is RR's version of David Diringer, whose fairly innocent (if dated) wording is interpreted in a hostile and tendentious manner. (Note, however, that Diringer's view could well be challenged with counter-examples, including perhaps that of the Inca.)

Where he discusses the issues grouped here under b), RR - like several contemporary non-linguists who have grappled with such matters - aligns himself overtly and almost naively with scholars such as the 'Nostraticists'. These scholars have proposed very specific 'deep-time' relationships between language families which are generally deemed not to be demonstrably related and thus not to have common ancestors, unless at a very early date indeed; and they have reconstructed proto-languages (allegedly spoken at more recent dates - but naturally well before known written records) for the resulting super-families. Merritt Ruhlen has gone so far as to propose that the ultimate ancestor language Proto-World can be reconstructed in part. Because this implies a relatively small time-depth, he argues that human language originated as recently as around 40,000 years BP, a much lower figure than those which most mainstream linguists would suggest (especially on the basis of recent evidence indicating that humans may have arrived in Australia as long ago as 70,000 years BP). RR refers (pp 35-47) to Ruhlen and to Joseph Greenberg (the best known of the Nostraticists), and follows them in presenting a division of human languages into only seventeen families; but he is by no means sufficiently cautious in embracing their very controversial ideas. He is certainly aware of the controversy (see pp 35-36, 39-42), but seems to regard with suspicion the mainstream reactions of rejection (or reserve); he shows no awareness of, eg, the statistical arguments against Nostratic advanced by scholars such as Donald Ringe. In consequence his comparative methods are similar to those which were practised before the rise in mid-C19 of comparative linguistics as we now know it. On pp 43-44 he identifies as cognates several sets of forms which may well display only accidental similarities. In some of these cases he uses data from later members of language families when this suits his case, ignoring what is known or hypothesised about the relevant ancestor forms, even though the latter are obviously the forms which would be really relevant in the reconstruction of older proto-languages. Then, in his theoretical summary of this data (pp 44-45), RR nonchalantly ignores even the obvious *prima facie* objections which one might raise to his procedures. Some of his sources for specific claims are also rather dated, eg, the reference to Edward Sapir's work on Na-Dene and Chinese in the 1920s (p 42). (Compare his use on p 67 of Petrie's views on the nature of pre-hieroglyphic Egyptian marks.) Immediately after this discussion (on p 45), RR soft-pedals the skepticism of the generally open-minded Renfrew about deep-time proto-languages, just before inserting a quotation in which Ruhlen indulges in speculation about Proto-World and the origin of human language, grounded mainly in his own already contentious claims. (Compare the adherence of 'fringe historical linguists'

Continued p 57 ...

Reading humanity's chart

James Gerrand

Genome – The autobiography of a species in 23 chapters; Matt Ridley. Fourth Estate, London. 344pp. hbk. \$45.00

This is a book of revelations about what is being found about how our genes form the basis of our human condition. The genome scientific discoveries currently being made as we begin the 21st century will revolutionise our understandings of life to rank with the two previous major scientific revolutions – the Newtonian physics revolution of the 17th century and the Darwin/Wallace evolutionary revolution of the 19th.

To fully understand the complexities of this work would demand a year or so's study. However Ridley does convey the main outcomes of what has been achieved to date by the worldwide scientific research based on the Human Genome Project – the mapping and sequencing techniques of the genes. In this review/summary I have only picked out some of the major revelations.

The human genome – the complete set of genes – comes packaged in twenty three separate pairs of chromosomes. Twenty two are numbered in approximate order of size from the largest (1) to the smallest (22). The remaining pair are the sex chromosomes: two large X (size between 7 and 8) in women, one X and one Y (the smallest) in men. Many species (including our closest relatives the apes), have more than 23, many have fewer. Inside the nucleus of each of our body's 100 trillion cells are two complete sets of the human genome (except in egg and sperm cell which have one copy each and red blood cells which have none). One set of the genome comes from the mother and one from the father. Apart from small and subtle differences (accounting for example for blue or brown eyes) each set includes the same 60,000 – 80,000 genes on the same twenty three chromosomes.

Ridley points out the human genome is a record "of all the vicissitudes and inventions that had characterised the history of our species and its ancestors since the very dawn of life". "There are genes that haven't changed much since the very first single-celled creatures." Some "were developed when our ancestors were worm-like", some "when ... fish", some were shaped from recent epidemics of diseases. Some "genes can be used to write the history of human migration in the last few thousand years." "... the genome has been a sort of autobiography of our species...". He claims that "Being able to read the genome will tell us more about our origins, our evolution, our nature and our minds than all the efforts of science to date."

The human genome can be regarded as a book of one billion three-letter words using only four letters: A, C, G and T. They are written on long chains of sugar and phosphate, the DNA molecules. Each chromosome is one pair of (very) long DNA molecules.

Ridley has written each chapter of his book about what important themes of our human nature are associated with each chromosome pair. In chromosome 1 there is "probably the most active gene" – a sequence of 120 letters that repeats and is constantly being copied into RNA, whose job is to translate DNA recipes into proteins. It is these proteins that enable DNA to replicate. "Life consists of the interplay between two kinds of chemicals: proteins and DNA".

Chromosome 2 is formed from the fusion of two medium sized ape chromosomes (apes have 24 pairs of chromosomes). There is just 2% difference between the human and the chimpanzee genome. We will know specifically these differences when the genomes of the typical human and chimpanzee have both been transcribed. It seems the environmental pressures of the Pleistocene era, particularly on the open African savannah, on *homo sapiens*, probably account for the differences.

For chromosome 3, Ridley relates in detail the scientific investigations that began in 1901 of a rare disease *alkaptonuria* that culminated in 1995 in the discovery that it was caused by one of its genes not having the correct letter in its 690th or 901st sequence.

In dealing with chromosome 4 Ridley regrets that presently our knowledge of the genes of our genome comes mainly from revelations about diseases when such arise from deficiencies or mutations. The *Wolf-Hirschhorn syndrome* is caused by a lack of a particular gene in this chromosome. A mutation of this gene results in *Huntington's chorea*. The gene contains a single word CAG repeated many times. If repeated less than 35 times all is well; if more than 39 times *Huntington's chorea* is the result. The age at which this syndrome appears is closely related to the number of repetitions: if 39 you have a 90% chance of dementia at age 75, if 40 at age 59, if 41 at 54, if 42 at 37, and so on until those with 50 repetitions will lose their minds at 27 years of age. *Huntington's chorea* was the first completely dominant human genetic disease to come to light.

Coming to chromosome 5, Ridley stresses that the impact of genes for most of us not unlucky enough to have a rare and serious genetic condition is gradual, partial, blended. There are often multiple effects of multiple genes. Whilst it has been found that the underlying cause of asthma is activation of the immunoglobulin-E system, yet this protein comes in many forms, any one of which can be triggered by different allergens. One person's asthma can be triggered by dust mites, another's by coffee beans. By mid-1998 scientists had found fifteen possible "asthma genes", eight on chromosome 5.

Finding a gene for intelligence has proven the most difficult task. Yet in 1997 Robert Plomin announced he and his colleagues had discovered a gene for intelligence in chromosome 6 by examining blood samples of gifted

teenage children (IQ's about 150) and hints at up to ten more "intelligence genes" to come from this study. Ridley points out that these genes may create an appetite for developing intelligence rather than an aptitude and thus would be influenced by the environment. However Ridley's view does not agree with the studies that showed identical twins reared in different environments produced near identical IQ results.

Ridley persuades us that a gene on chromosome 7 plays an important part in equipping us with the instinct to learn language. Chomsky had reported finding similarities in all languages. Evidence from a number of later studies has endorsed this conclusion of a language grammar instinct, including how children adapt a pidgin into a more efficient language. This instinct appears to switch off when adult as evidenced that learning a language is easier when young.

We now come to the sex chromosomes – X, the next largest after chromosome 7 and Y, "a tiny and almost inert stub of a genetic afterthought". "At some point in our past, our ancestors switched "from the reptilian habit of determining sex by the temperature of the egg to determining it genetically. Ridley suggests the reason was so each sex could start its role at conception. The sex-determining gene *SRY* makes us mammals male, and its lack, female. This gene attracted other genes to benefit males: genes for big muscles or aggression. There is even evidence from experiments with fruit-flies that the protein from the male seminal fluid entering the female blood stream migrates to her brain, to reduce the female sexual appetite and increase her ovulation rate, all to stop seeking sexual partners and instead seek a nesting site. There is evidence that being lower in the male birth-order increases the chance of being a homosexual; a set of three genes on the Y chromosome is responsible. There is no such birth-order effect with lesbians.

Chromosome 8 is one of the least mapped so Ridley uses its chapter to relate how many genes just exist to replicate themselves – or the "selfish gene" as Richard Dawkins so designated. These DNA parasites are also a threat as they can jump from one location to another causing mutation of working genes. They can cause *haemophilia* by landing in clotting-factor genes. Fortunately us humans are less troubled by DNA parasites than some other species. Similar to a DNA parasite is the "hypervariable minisatellite". This little sequence is found on all the chromosomes, at more than a thousand locations in the genome, where there may be a variable number of repeats of the sequence. The result is a unique set of numbers for each individual. This is the basis of the astonishing success of DNA testing – genetic fingerprinting – its ability to acquit the innocent and condemn the guilty. It has been used not just for forensic science. It confirmed the identity of the exhumed corpse of Josef Mengele, confirmed the presidential source of the semen on Monica's dress, it identified the illegitimate descendants of Thomas Jefferson, it has blossomed in paternity testing, including the discovery that cuckoldry and infidelity is common in the most monogamous of birds – thrushes, robins and warblers.

On chromosome 9 lies the gene that determines your blood group – O, A, B or AB. A and B are "co-determinant" versions of the same gene, O is the

recessive form. It is astonishing how small differences in its text, 1,062 "letters" long, determine the group. Four different letters at 523, 700, 793 and 800 decide whether you are type A or Type B. A few have some of the A letter and some of the B; they are the AB. People with the O group have the 258th letter of the A sequence missing. This small difference causes a different protein to be made. In recent decades a connection has been found between blood groups and *cholera*. Most resistant are those with AB, followed by A, followed by B with O the most susceptible. The native American population is almost exclusively type O, as against 40% for Europeans. This may reflect the fact that *cholera* is a disease associated with crowded and unsanitary conditions, never established in the newly populated continents of the Americas.

An important gene on chromosome 10, *CYP17*, makes an enzyme which converts the body cholesterol into cortisol and two other hormones. Long-term stress results in an increase in cortisol which suppresses the workings of the immune system by switching genes on. This is personally interesting as I have a disorder CIDP giving me "feet of clay" which seems to arise from a too active immune system. Some of my antibodies, the immune agents, attack the insulation on some peripheral nerves, considering them foreign. Perhaps I need to be stressed more!

A gene *D4DR* on chromosome 11 is the recipe for a protein called a dopamine receptor. Dopamine is a neurotransmitter responsible for many activities in the brain, including the flow of blood in the brain. A shortage of dopamine in the brain can cause an indecisive personality, or in the extreme form, Parkinson's disease. An excess of dopamine may be the cause of schizophrenia. Ridley suggests dopamine is the brain's motivation chemical, is responsible for a difference in personality. However it seems *D4DR* may be just one of some 500 genes that affect human behaviour. However whilst personality has this strong, if multitudinous, genetic basis it can be changed by the environment such as by the right kind of parenting. For example therapists have found that telling a patient that his/her shyness was innate, genetic, raised their self-esteem and improved their interpersonal relationship.

A large cluster of genes in the middle of chromosome 12 is responsible for the way the human foetus develops. These "homeotic" genes which, like all our genes, are in every cell, dictate from the relative position of a cell where a head or a tail, a leg or an arm, is formed. The order of a group of eight genes, known as the Hox genes, for the fruit-fly was found to determine its mouth, face, top of the head, neck, thorax, front of abdomen, rear of abdomen, other parts of the abdomen. Much the same applies to the human species. "Flies and people are just variations on a theme of how to build a body that was laid down in some worm-like creature in the Cambrian period". An incredible experiment demonstrates the similarity – "... geneticists can knock out a gene in a fly by deliberately mutating it, replace it with genetic engineering with the equivalent gene from a human being and grow a normal fly."

People with a rare mutation in gene *BRCA2* on chromosome 13 are much more likely to develop breast cancer. The gene was located by studying Icelandic families with a high incidence of breast cancer. The Ice-

landic population, from its settlement around 900, has become particularly inbred due to its isolation. Two Icelandic families with a history of breast cancer have been traced back to a common ancestor born in 1771. A different mutation of the same gene gives rise to an incidence of breast cancer in people of Ashkenazi Jewish descent, again a group with inbreeding.

A gene *TEP1* on chromosome 14 produces a protein which forms part of telomerase, lack of which causes senescence, its addition turns certain cells immortal. Each chromosome can be copied except for its very tip. At the end of each chromosome there is a repeated stretch of meaningless "text", TTAGGG repeated about two thousand times, called a telomere. Every time a chromosome is copied, a little bit of its telomere is left off. In our bodies the telomeres are shortening at the rate of about thirty-one "letters" a year. That is why cells grow old. In an eighty-year-old person, telomeres are about five-eighths as long as they were at birth. This shortening does not happen in egg cells and sperm cells due to the presence of telomerase, which repairs the frayed ends of chromosomes, re-lengthening the telomeres. However aging is under the control of many genes. Also there is the paradox that switching on of telomerase is essential for a cancer to turn malignant.

A deficiency in a gene in chromosome 15 has been found to cause two rare genetic diseases. One, the *Prader-Willi syndrome*, was from the father's chromosome; the other, *Angelman's syndrome*, was from the mother's chromosome. The gene "remembers" which parent it came from because it is endowed at conception with a paternal or maternal imprint. The imprinted region of chromosome 15 contains about eight genes. One of these when broken is responsible for *Angelman syndrome*, another two when broken are candidates for *Prader-Willi syndrome*. There is evidence that these imprinted genes are active in the brain. Such evidence has implications for behaviour differences between the sexes. Autism, dyslexia, language impairment and other social problems are much commoner in boys than girls. Boys are more competitive, more interested in machines, weapons and deeds. Girls are more interested in people, clothes and words.

Genes on chromosome 16 allow learning and memory. The genome has developed the brain to extract information from the world and embody that information in behaviour. *CREBBP* is the crucial ally to *CREB* on chromosome 2 to learning. It seems when you learn something, you alter the physical connections of your brain so as to create new, tight connections. Long-term memory resides in the neo-cortex; the mechanism for creating it is in or near the hippocampus. Such knowledge has been gained by studies of persons who have suffered damaged to parts of their brains. Sensory information, sent from the visual, auditory, olfactory or other areas, is processed and made into memories in the perirhinal cortex, perhaps with the help of *CREB*. The information is then passed to the hippocampus and thence to the diencephalon for temporary storage. If deemed worthy of permanent preservation it is sent back to the neo-cortex for long-term memory.

Gene *TP53* on chromosome 17 is the most important of switches designed to induce a cell to commit suicide if it should find itself turning cancerous. A tu-

mour to develop must first contain a cell that has both a jammed-on oncogene and a jammed-off tumour-suppressor gene. Then to grow uncontrollably the tumour must pass by the gene *TP53* that detects abnormal behaviour in a cell and instructs different genes to dismantle the cell. The protein p53, manufactured by *TP53*, is being developed as an anti-cancer drug. A mutation in the *TP53* gene is found in fifty-five per cent of human cancers, ninety per cent for lung cancers. People born with one faulty version of *TP53* out of the two they inherit, have a ninety-five per cent chance of getting cancer. Many cancers develop through a number of mutations with *TP53* often coming last. This fact demonstrates the importance of early detection of cancer. Likewise it is clear why cancer roughly doubles in frequency every decade of our lives. The longer we live the more mistakes we accumulate in our genes. There is evidence that radiation and chemotherapy work by alerting *TP53*. When such treatments no longer work then it is likely because *TP53* has mutated. This suggests a new approach – test to see if *TP53* has mutated to tell in advance whether conventional therapy is appropriate.

Ridley uses a gene on chromosome 18 that suppresses colon cancer to discuss genetic manipulation. Quite soon, thanks to what is being discovered about genetic engineering, if you are born with a faulty version of this gene such that you have an increased risk of cancer, then you will be able to have it replaced it with the non-faulty version. Scientists use a "glue" – an enzyme called ligase which stitches together loose sequences of DNA. They use "scissors" – one of 400 different restriction enzymes – to cut a sequence of DNA letters. By such a process the first genetically engineered bacterium existed – a gut bacterium infected with a gene taken out of a toad. Now a human gene can be "cloned" by isolating it, putting it in a bacterium to grow millions of copies so that its sequence of letters can be read. The next step has been to develop gene therapy by using retroviruses. A gene therapist takes a retrovirus, cuts out a few of its genes, puts it in a human gene and infects the patient with it. The virus goes to work inserting the gene into the cells of the body – you have a genetically modified person. The first use of this gene therapy was to treat a child with Severe Combined Immune Deficiency (SCID) caused by a mutation on gene *ADA* on chromosome 20. The treatment was to infect the child with a retrovirus armed with a new *ADA*. Now more than one in four children with SCID have had this gene therapy. Ethical and safety fears of genetic manipulation have proved groundless in thirty years of genetic engineering.

If the gene *APOE* on chromosome 19 has a bad version *E4* then you have both a greater chances of heart disease due to high cholesterol and also of Alzheimer's disease. The chances of getting Alzheimer's are twenty per cent for those with no *E4* gene and the mean age of onset is eighty-four. For those with one *E4* the probability rises to forty-seven per cent and mean onset seventy five; with two *E4* genes ninety-one per cent and onset sixty-eight. By having genetic tests it is now possible to predict a person's risk of contracting Alzheimer's disease. They can also help in indicating whether a treatment is likely to work. For example a new drug tacrine has been found to work better in those with *E3*

and *E2* genes than in *E4* carriers. This raises the ethical question as to who should know an individual's genes. The suitable answer is that an individual should have the right to know his/her own genes but not anybody else nor any organisation without the individual's permission. An exception would be in the case of a criminal investigation where genetic information might clear or convict a suspect. Even in this latter case the gene information should be kept confidential if and until required in a criminal prosecution.

There is a gene *PRP* on chromosome 20 that has been found to give rise to a disease such as scrapie in sheep and other animals and kuru in a New Guinea tribe, since identified as *CJD* (*Creutzfeldt-Jakob Disease*). *PRP* is a normal gene which produces a protein prion with the unusual property: it can change into a tough and sticky form that gathers into aggregate lumps, disrupting the cell. This new form of prion has the capacity to reshape normal prions in the way they fold up. By experiments with mice it was found that mice without prion genes did not catch the *CJD* but a dose of misshapen prion genes would give the disease to another mouse. It has been found that a mutation changing the 200th word of the 253 words of the *PRP* gene causes the *CJD*. These misshapen prion genes were the cause of the "mad-cow" disease recognised in 1986 in the UK. Notwithstanding the fear that the "mad-cow" disease would be transmitted to humans no such case has been identified. In fact eighty-five per cent of all *CJD* cases are "sporadic" – perhaps spontaneously at a rate one case per million people.

If a child is born with three copies of chromosome 21 instead of the normal two, then he/she has Down syndrome. The child is mentally retarded, gentle and destined to age rapidly and die before the age of forty. The probability of a mother conceiving a Down-syndrome baby grows rapidly and exponentially with her age, from 1 in 2,300 at age twenty to 1 in 100 at forty. In most countries amniocentesis is now offered to all older mothers to check whether the foetus is carrying the extra chromosome. Such genetic screening is a form of eugenics now largely acceptable where private individuals are given private choices on private criteria. China is the one country where state eugenics is practised; premarital check-ups are compulsory and give to doctors, not parents, the decision to abort. The need to control their bursting population is the factor requiring Chinese government intervention.

Ridley reports that as he completed his writing, the Sanger Centre, Cambridge – the laboratory leading the world in reading the human genome – announced they had the complete sequence of chromosome 22. However he has nothing significant to report on its genes so he uses this last chapter to discuss whether we have free will. If we have, it does not come from our genes. Some claim it comes from society, culture and nurture. One particular determinant recently discovered is peer pressure in our modern society. He does make the point that our actions are determined by many influences from our genes and our environment. Freedom, he considers, lies in expressing your own determinism, not somebody else's. I would agree with this.

Regarding this debate on free will *v* determinism, my conclusion is that if at any time our whole bodily and mental make-up at a particular time could be ex-

pressed in some understandable matrix, then we would see that our behaviour at that time will have been determined. However we can change our behaviour by choosing what we find as rewarding. For example, some people will decide that belief in a religion is rewarding to them, and their decisions will to an extent be based on their religious outlook. For myself, a scientific approach, a decision on the evidence, is what I have decided on from experience is what is best for making important decisions. So it is this reliance on science that determines a lot of my behaviour.

I pick a bone with Ridley when he discards operant behaviour as a determinant because of an experiment where orphan baby monkeys became emotionally attached to cloth models of their mothers even when being fed from wire mothers. To me all this experiment indicated is that baby monkeys have genetically an emotional attachment to their furry mothers. Skinner, the founder of operant behaviour, always hoped he could extend his conclusions to the emotional area but without success. But he did clearly scientifically prove that we are born with a desire to be reinforced by rewards and repelled by punishment.

I strongly recommend this book to all who wish to know about the latest revolutionary findings about how our genes play such a major part in our make-up. What I look forward to is some enterprising scriptwriter producing a TV 23 part series, broadcasting for each of our 23 chromosomes what has been discovered about their importance to the human species.



The Human Memome Project

Ben Morphett

You would probably be aware of the Human Genome Project (see preceding review), which plans to specify to the base-pair level, all of the genes in the human chromosomes. You might not be aware that in parallel with the Human Genome Project, there is the Human Memome Project, which plans to collect all of the memes which are part of all human cultures. All ideas, sciences, languages, religions, jokes, habits, stories, songs, and so on, cross-referenced and in one huge collection.

One early attempt at the Human Memome Project was the *Encyclopaedia Britannica*, which failed primarily because it was restricting itself to memes - which are factually correct, whereas of course, memes can be whatever they like. The most recent attempt, which shows every chance of being successful, is the Internet. Very shortly, all human cultural artefacts will be present on the Internet - true, false, insane, wise, boring, fascinating, and whatnot? How about that? And you suspected that it was just about down-loading porn!

BTW, the E. Coli Memome Project was very easy: here's the complete list.

There. Wasn't that interesting?

PS. Apologies to EB: of course I am aware that they deliberately restrict themselves to the factually correct, and for good reason. I was merely unwilling to let the facts get in the way of a good story.



Linguistic evolution

Mark Newbrook

Comment on the linguistic discussion in Pennock R. T. (1999) *Tower Of Babel: The Evidence Against The New Creationism*, MIT Press, Cambridge (Mass.)

Robert Pennock is a philosopher of science at the University of Texas in Austin. His book constitutes a timely rebuttal of the arguments of the newly arisen cluster of relatively sophisticated (pseudo-)scientific creationists ('intelligent design theory' advocates) such as Michael Behe and Phillip Johnson, who have persuaded many that there is after all a scientific case for a literal interpretation of *Genesis*.

Pennock's book is thorough, scholarly and insightful, his presentation of the issues is clear, and he is particularly impressive (as one might expect of a philosopher) in drawing fine but crucial distinctions between claims, standpoints and arguments. His book has been challenged (not always very expertly) on various philosophical points and has inevitably received hostile reviews from creationists; but he has rebutted these objections extremely effectively. Here I take the philosophical strengths of the book as given, and focus on a somewhat novel aspect of Pennock's work: the extensive use which he makes in this context of the facts of human language and in particular of the nature of linguistic change. Pennock's title suggests a linguistic focus, and in Chapter 3 (pp 117-179), and sporadically elsewhere, he discusses the creationist-evolutionist debate in this specific context rather than in the more familiar context of biological evolution. This, he says, is partly because the issue of language change is less 'charged' (which is certainly true), and also partly because *Genesis* contains the well-known story of the diversification of languages at the Tower of Babel, which most creationists naturally interpret as literally true but which no mainstream linguist would take seriously (for obvious reasons).

The analogy between linguistic change and biological evolution is not, of course, entirely precise, and readers of Pennock must bear this in mind, since this is a point which a casual reader might fail to grasp. Indeed, one of the few criticisms which can reasonably be made of the book is that Pennock - who is, in general terms, well aware of most of the differences between biological and linguistic change - is not always quite explicit enough on such points. And in a few places, notably where he exemplifies adaptive linguistic changes from vocabulary borrowing (pp 140-141), it might be thought that he has chosen examples of a type which suits his case considerably better than some other phenomena would - although in fact I do not believe that this was deliberate. However, these are small blemishes, if such they are, and a careful, well-informed reader will cope with them. Certainly Pennock's analogising argument from linguistic change, at the level at which it is intended to be understood, is just as persua-

sive against creationism as are similar arguments involving biological data. And, as we shall see, some of the differences between linguistic and biological evolution are not as great as might at first be imagined.

Nevertheless, it is still of interest to examine these differences between linguistic and biological change. First of all: the distinguishing features of particular languages (grammatical, phonological, lexical etc) are characteristics coded and transmitted culturally rather than genetically, and are thus 'acquired' characteristics (= acquired by the organism in its lifetime). Changes involving them are thus evolutionary in this precise sense. With an eye on the history of the theory of evolution, one might be tempted to call such changes 'Lamarckian', but as we shall see many of them are not adaptive in the way suggested by the classical Lamarckian account of 'acquired' characteristics. The fact of cultural transmission distinguishes such changes from biological changes involving (random) mutation in genetic inheritance. (If anyone doubts this account of linguistic change, it is clearly demonstrated by the fact that - even if, as Chomskyan linguists hold, we inherit the most basic characteristics of language genetically - we do **not** inherit our specific languages genetically; we acquire the languages/dialects/accents current where we grow up, and these may be utterly different from those of our parents.)

However, this point does not damage Pennock's use of the facts of linguistic change against creationism, and he certainly does not try to fudge or conceal it. The **precise** mechanisms by which changes and diversification occur vary in all domains, and differences in what predominates from domain to domain are not really relevant to the issue. The argument against creationism is at a more general level.

It should be noted that many of the linguists - Chomskyans and such - who are especially interested in the genetic aspects of language acquisition recognise little diversity and hence limited scope for change in the general framework which they believe is inherited. This is true to such an extent that Chomsky himself - though not a creationist or even an 'intelligent design supporter' - can be read as equivocal about the possibility of formulating plausible, specific scenarios for the evolution of human language as an entire phenomenon out of pre-human communication systems (and has thus given comfort, perhaps unwittingly, to creationist linguists). But this is not an unavoidable feature of the relevant theories; it may, indeed, be seen as an aberration.

A second major difference between linguistic and biological evolution involves the fact that many short-term, specific linguistic changes do **not** seem to be adaptive, in that the later forms (eg, in grammar) are no better suited to the speakers' environment (be it stable or changing) than the earlier forms from which they

are derived. They have often been likened to changes in fashion or, more technically and perhaps more helpfully, to 'cultural evolution' more generally. Even if motivation for them can be adduced, it does not usually involve accommodation to the environment, still less improvement of the chances of survival/reproduction. There are of course exceptions to this, but they mostly involve less central and less systematic aspects of languages such as vocabulary, eg, the clearly adaptive 'borrowing' or coining of new words to deal with new concepts. As noted above, Pennock's main examples (eg, pp 140-141) are of this latter type, a type which is much more readily understood by non-specialists (and may have loomed large in Pennock's mind for that reason).

However, this difference is, again, not damaging to Pennock's approach. As before, the central issue is the well-established facts surrounding the nature of change and diversification, rather than the details of the mechanisms or motivations involved. In any case, there are biological changes too which are hardly 'adaptive' in any strong sense.

There are a few more specific differences between linguistic and biological change, but these are mainly matters of rather fine detail which in no way detract from Pennock's case. For instance, attempts have been made to individuate languages using the criterion of mutual intelligibility; these are parallel with attempts to individuate biological species using the analogous criterion of inter-breeding. Neither of these ideas has held up especially well in strong terms. In linguistics, this was perhaps predictable (at least for socially-aware linguists concerned with variability), given the rather obviously 'fuzzy' boundaries of geographically-adjacent, related 'languages' (as in a 'dialect continuum'). Even here, the tendency in developed societies towards standardisation has promoted the concept of separate, countable languages and has discouraged accurate perception of the more usual patterns dominated by complex variation and 'messy' geographical boundaries. The limited success of the equivalent notion in biology was perhaps a little less predictable: traditional notions of the species suggested that here the boundaries should be more determinate. But current conceptions of species have had to allow for more 'fuzziness' in biology as well - which is, of course, very threatening to creationists with their focus on inherently separate biological 'kinds'. The upshot is, in fact, that neither species nor languages are 'water-tight' entities (which strengthens Pennock's analogy).

Now within the two sets of arguments there are certain detailed differences between these two cases. For instance, there seems to be nothing in the biological sphere quite analogous to the way in which (for a variety of reasons, some linguistic and some socio-cultural) mutual intelligibility between 'languages' is not always equal in the two directions. An example involves Portuguese and Spanish: they are closely related but the latter is structurally somewhat simpler and more perspicuous at most (not all) points where they differ, with the result that untutored speakers of Portuguese typically understand Spanish more readily than *vice versa*. However, no-one could reasonably argue that the ab-

sence of phenomena in biology analogical to something so specific damages Pennock's general case.

Despite generally careful wording and a rather late excursus (pp 159-163), a harsh critic might suggest that Pennock fails to distinguish adequately between a) the origin of human language as an entire phenomenon and b) the origin (and development) of individual languages, as discussed above. For obvious reasons, rather little is known about the former process (though the volume of published research is growing fast); but it may very well have been more strongly adaptive in character and hence might be deemed 'evolutionary' in much the same sense as many aspects of the biological development of the species. (Some linguists actually prefer to restrict the term *evolution* to processes of type a), because the parallels with biology are closer here and biology is the domain where evolution is most obviously a dominant factor.) A related point involves the fact that all known 'normal' languages, ancient or modern, seem to be of roughly the same order of complexity, flexibility etc, and hence presumably represent much the same stage of evolutionary development. More 'primitive' languages must surely have existed before human language in its modern form evolved and while it was evolving; but no such languages are available today (all this occurred, on current estimates, at least 50-100,000 years ago, and because writing is a recent invention we have no specific language data more than a small fraction of that age).

On the other hand, there is no reason to suppose that it will ever be possible to draw a really sharp boundary between processes of types a) and b) as described above. Given the nature of evolution more generally, it would in fact be surprising to find such major differences of type or discontinuities in linguistic history. It would surely be unreasonable to require Pennock to base his claims upon distinctions which linguists themselves would struggle to reify.

It is also important for those of us involved in the mainstream of linguistics not to be seduced by the currently fashionable hyper-egalitarian dogma of near-absolute 'linguistic equality'. Whether one regards additional complexity positively or negatively, and however one seeks to integrate recognition of such differences into theories of the development of human language, there is no doubt that at a detailed level some otherwise similar languages are more complex than others. Indeed, some prominent linguists (of various persuasions) have admitted as much. Icelandic and Afrikaans are both Germanic, but Icelandic grammar (especially the inflectional morphology) is considerably more complex (and more irregular) than that of Afrikaans. Note also cases such as that of Spanish and Portuguese, mentioned earlier. Well-informed, critical outsiders like Pennock can do us linguists a great service by reminding us that we too may have our sacred cows.

Pennock (p 159) likens the origin of human language to that of life itself, and the development of individual languages to that of individual species. This also provides a useful perspective in respect of the mutual-intelligibility criterion, as discussed above: if languages are seen as analogous to inherently 'fuzzy' groups/types of individuals such as species, a

well-known logical objection to that criterion can perhaps be regarded as less damaging, or at least as damaging only to rather naive conceptualisations of the case. On the other hand, given some of the above points, another analogy (focusing more specifically on the adaptive aspect of evolution) might involve seeing all human languages as rather similar instances of the **same** species, differing very little in 'fitness'. Only a few of the factors determining the success or failure of individual languages relate to their own characteristics; the key factors involve, eg, the power and prestige of their users. They still compete with each other in a social and cultural sense; but, in these terms, it is human language as a whole which has competed in a biological sense for the one relevant niche with other, earlier communication systems - and it won its battle completely, long ago. However, these are, of course, only analogies, not competing theories, and must not be pressed too far. The usefulness of one does not obviate that of another.

Pennock's text contains only a very small number of more specific, problematic statements about language; one of these is simply a slip and the others are venial given that he is not himself a linguist. For instance, he does not seem fully aware (on pp 136, 143) of the highly controversial status (to say the least) of deep-time proto-language reconstructions such as those of Ruhlen, Greenberg and the Nostraticists (even though some of these do tally fairly well with non-linguistic data such as the genetic data correlated by Cavalli-Sforza and his colleagues). But some of his other points about language are very well-made. In addition, he gives a good account of 'creationist linguistics' (pp 120-125) - though he might also have referred to the recent (but arguably obscure) work of syntacticians such as Baker who have arrived at some very strange historical linguistic analyses partly on the basis of creationist notions.

But the specific disparities, and the very few problems which I have identified above, do not detract at all from Pennock's main case, which (as I have said) I find very clear and persuasive indeed. Indeed, Pennock has much to say that is of great interest to philosophically-inclined historical linguists (some of which follows up the important work of Lass) - and indeed to anyone interested in these matters.

**Drays Soured?
Rude, Sad, Rosy?**

**No need to be puzzled.
If you're changing
Your Address
please let us know
and we won't be either.**

... Lost civilisations from p 50

such as Andis Kaulins, Zoltan Simon and the 'Saturnists' to viewpoints of the Nostratic type, which can be adduced as providing 'respectable' background or support for their own very idiosyncratic theories.)

RR is quick to cite (p 40) non-linguistic (dental and genetic) evidence in favour of his favoured 'deep-time' analyses which is interesting and relevant in this context but which is not decisive (since there is no necessary equivalence between language families and the populations which use the languages). Even here he ignores some well known sources from which he might derive additional support. In this passage he also argues somewhat tendentiously in various ways:

- i) he posits what might now be regarded as a rather short time-depth for human settlement in the Americas (so as to reduce the time available for linguistic diversification there);
- ii) he ignores any possibility of linguistic diversity at the time of settlement; and
- iii) he shows no awareness of the debate between Robert Dixon and Johanna Nichols on the question of whether long time-depths are in fact likely to produce more linguistic diversity in the first place, or rather **less** (which involves different views about the relative strength of the factors promoting divergence and convergence in multilingual situations).

There are a number of points where RR's reasoning appears faulty or at least loose. Near the foot of p 40 the basic argument about the justification of linguistic family trees is at the very least grossly incomplete. On p 52 RR follows Schmandt-Besserat in making a great deal out of the question of cross-cultural similarities in the directional linear ordering of symbols; but there are only a limited number of possibilities here, and chance similarities are obviously to be expected. Li's argument about the Chinese word for 'hemp', cited with approval on p 139, is also far from decisive. And it is not clear that what RR calls a 'loaded statement' on pp 56-57 is anything more than a statement of an opinion with which he disagrees. If it is false, as RR believes, that is another matter.

RR at times attributes resistance to his ideas to 'entrenched traditions' embodying opposing views. For instance, on pp 79-80 he quotes Bouissac as taking this view of negative mainstream reactions to the notion of writing in the Palaeolithic. In his conclusion (pp 261-263) he urges a similar interpretation of 'conservative' mainstream notions more generally. Skeptics are familiar with this kind of observation, and - while such a view may **sometimes** be justified - it is common to find on closer investigation that the evidence/argument supporting the non-mainstream position is not in fact as strong as its advocates suggest. Despite RR's winding-up comments on p 263, mainstream advocacy of an opinion on the ground that it currently represents the best available analysis does not amount to dogmatism. As he himself admits in this very passage, mainstream views alter as evidence is added and argumentation develops. His views too would come to be accepted (eventually) if he could produce evidence and argumentation of the right quality. So far, these are conspicuous by their absence.

Alive in the Universe

Miles MacLeod

Carl Sagan: A life in the Cosmos, Keay Davidson, J Wiley & Sons.

As a young teenager I was one of the Sagan 'groupies,' intoxicated by his ebullience and optimism. His vision seemed so boundless and the young imagination could not help but be drawn to it. Indeed there is no other individual to whom I can more attribute my present fascination with science. My first taste of skepticism was via Carl Sagan's work. I realise now I was probably the only male in high school that watched *Star Trek* yet didn't believe in UFOs.

Behind those poetic visions that so inspired me was an intellectually diversified and emotionally complex character who sustained the roles of a scientist, skeptic and populariser. He spent his life somewhat reforming the public image of both science and skepticism, and so for both science and skepticism his life and thoughts are worthy of analysis. It was therefore with an innate interest in the development of skepticism and the presentation of science that I approached Keay Davidson's biography.

Davidson takes on the task of exploring the character and philosophies of Dr Sagan. He does so in an entertaining and revealing manner, although it is not a flawless performance on his part. Principally he is interested in the dichotomies of Sagan's personality. Biographers are typically obsessed with dichotomies, you can make easy mileage out of them. But it is not an unwarranted approach in Sagan's case; he could behave in very different ways towards different people and as it emerges the image the public held of him could be quite different from that of his relatives or colleagues.

His private and family life, indeed his emotional development, is a principal focus of the book. In his written material he was a master at inspiring the reader. He comes across as personal, affable and charming. Yet, as Davidson reveals, for all his amiability he would have been one of the hardest men to be married to. His behaviour towards his first wife, the biologist Lynn Margulis, was selfish if not despicable. He could be cold and unemotional, distant and self-absorbed. Davidson describes many relationships which Sagan left strewn in the wake of what many interpreted as abject careerism. His petulance is hard to reconcile with calm and personable narrator of *Cosmos*, and I admit, surprising. Readers will no doubt be perplexed, even fascinated, by his private behaviour but I do not wish to dwell on it here.

As a scientist Sagan's career was undoubtedly successful though not brilliant. His greatest contribution came in the form of his originality and wide-ranging focus. The Venus greenhouse effect and the nuclear winter theory were among his better scientific contributions. He arrived at university as a young thinker filled with thoughts, ironically enough, of UFOs and extra-terrestrials just as the Miller-Urey experiments

were taking place. It could not have been a more exciting time to be a young scientist with a budding interest in the origins and possibilities of life. Perhaps because of his exposure and his early involvement with these scientific movements, or perhaps because of a natural fascination, he spent much of his professional career speculating and exploring the possibility of life on other worlds, obsessively. As Dale Cruishank points out, "there are two people in astronomy who made it okay to use the word 'organic' in astronomy, Carl is one of them, and Mayo Greenberg the other." Davidson's descriptions of Carl's work were to me among the most interesting parts of the biography. Davidson nicely conveys that peculiarly 'saganesque' style of science. Even in his most serious papers one senses a mind stretching the scientific possibilities, in all disciplines, to their limits. Life was possible he asserted on the Moon, Jupiter and even Mercury. Even late in his life Jovian balloon animals kept cropping up in his dissertations. As Davidson puts it, "he clung to a near-mystical certitude that physics and chemistry are so constructed as to make the origin of life easy." He likens Sagan's approach as a kind of Popperianism, he was continually posing unlikely scenarios, and indeed Sagan did once or twice justify his wilder speculations by retorting they had yet to be falsified. He rarely chose mundane topics.

Inevitably it seems he raised the ire of colleagues with his speculations, and the ephemeral nature of his attention to any particular topic. For those who merely resented his popularity or his showmanship, his method of science was an easy point of attack. He made scientific errors, he let colleagues down by overloading himself with work, and many felt he often received credit for others' work simply because he was more visible in any partnership than his slaving comrades. Somewhere along the line he annoyed his former mentor Harold Urey, the result, Davidson believes, was the denial of tenure at Harvard. All this hostility culminated, of course, in his rejection for membership of the National Academy of Sciences. The biography gives a good account of this now rather infamous event in the history of science. His eventual admission in 1994 was an admission by scientists, perhaps, to the fact that the popularisation and communication of science is a much a part of the grand enterprise as the knowledge itself.

Davidson nicely interweaves Sagan's later political activities with his belief in extra-terrestrial life. Of concern to Sagan it seems was the value of "L" in the Drake equation, the constant that measures the probability of a civilisation surviving its own technology. In time he became one of the most forceful opponents of nuclear weapons and indeed he justified SETI, even to senators, on the basis that contact would provide humanity with perhaps the most sanguine knowledge it had ever received, L could not be zero. His pursuit of the 'nuclear winter' scenario was very much emphatic of his

belief that to beat a civilisation required a maturation. In many ways his support of the theory was politically opportunistic for the now openly left-wing thinker, many good scientists were against it, but it was also noble, he risked the wrath of the political establishment by personally taking on its defence in the face of hostile bureaucracy. Sagan nevertheless had an incredible faith in technology that many on the humanist side would label naïve and scientific. It was a faith that science and technology could solve humanity's ills. He believed for instance that joint-power space exploration could end the 'cold-war.' Humanity simple had to learn to use technology responsibly.

As a science populariser Sagan was brilliant, a master of communication and simplification. To Davidson, "He did not simply want to inform readers and audiences, he wanted to enchant them." He was blessed with the instinct of performance, a natural showman, and he gravitated towards cameras and microphones as much as they were drawn towards him. "By the time he left Harvard science reporters knew him on sight. They gravitated towards him at NASA press conferences, while his neglected colleagues were left staring at their microphones." Davidson believes much of his success can be accorded to the image he presented of himself as a non-establishment figure. He gave up his connections with the military, he wrote a book with the Russian Shklovskii, made relaxed appearances on the *Tonight Show* with Johnny Carson, and casually moved about in a turtle-neck sweater. A very attractive figure to the young TV-generation of the time.

The biography gives a good account of most of his popular works and an especially interesting account of the TV series *Cosmos* where it seems Sagan's obsession with control and his inability to trust others' judgments pushed the staff to their limits. Nevertheless it was *Cosmos* that "finally fixed Sagan's place in the celebrity firmament." Indeed what many scientists hostile to him didn't at the time realise was that much of science's popularity in the 80's was largely due to Sagan.

Of most interest to us should be Sagan's skepticism. His style of skepticism raises the question of what is the most effective manner of dealing with pseudo-science and anti-science. Sagan grew up in the era of Donald Menzel an aggressively sarcastic skeptic who intimidated his opponents with his intellectual superiority. Sagan took a starkly different, more humanitarian and democratic approach. As Davidson states "Sagan did not sympathise with UFO devotees, but he empathised with them; he knew what they were feeling....." He was willing to talk on equal terms with pseudo-scientists such as Velikovsky where other scientists were most hesitant about being seen anywhere near him lest their presence accord him undue credibility. The media held that Sagan won the symposium with Velikovsky, but whether his approach worked more effectively is not conjectured on by Davidson, but must be a great importance to the Skeptic movement. Menzel certainly distrusted Sagan's approach, for a while he couldn't decipher whether Sagan actually believed in UFO's or not. When Sagan was asked to come before US House of Reps in 1968 on the matter his penchant for double-negatives and refusal to close his mind, not only confused the congressman as to his position but left skeptics infuriated.

His skepticism was characterised by patience and a willingness to listen to his opponents, even reason with them, but never to belittle. However Sagan had a perspective on human nature that was very optimistic. He characterised pseudo and anti-science, according to Davidson, as a kind of boredom with life. Indeed Sagan was optimistic enough to believe that science could satisfy that boredom if taught well enough. *Cosmos* was just such an attempt. Davidson states, "Sagan....believed that TV coverage of science could lure the public away from it unhealthy fascination with pseudo-science and irrational belief systems." Yet it is an essential question that Sagan leaves us with, although Davidson does not explore it. Can science ever sustain the entertainment or personal value that irrationalism promises? Is the fight against it a fight against human nature and therefore hopeless, should we be aggressive in our approach or should we be understanding. Perhaps this issue can be pursued as an issue later of *the Skeptic*. Certainly Sagan's skepticism was one of the most important facets of his personality and his method is well-worthy of analysis.

On a somewhat sad note Sagan's optimism in human nature was made to look illusory by Hollywood after he had died. *Contact* was a good entertaining film that would delight the scientist and skeptic alike, but not it seems the general public. It was overwhelmed at the box office by *Men in Black* and *Independence Day*. Lynda Obst, the producer made a rather wistful comment in response, "Carl always told me that if you give them the real [scientific] stuff, they won't need the reptilian brain stuff, they won't need the sex and the blood and the guts and the gore. And that inspired me through my career. I believed it. But now I'm not sure that's true."

In all Davidson gives a very good account of Sagan's life and the issues it generated. Often he refuses to pass judgment on Carl and lets his friends and enemies do that for him; an effective biographical technique. However the focus on the dichotomies of Sagan's personalities, which I have largely ignored, can at times be distracting. There is a tendency to drift into psychoanalysis, much is attributed to his mother's personality, and at times the over-emphasis of the humanist/scientist distinction can be grating. The really good biographies, such as James Gleick's of Richard Feynman rarely get drawn into psychoanalysis, particularly in relation to scientific thinking. To find family motivations behind scientific reasoning is in my mind deeply insulting to the scientist. Thankfully it does not take a central role in Davidson's biography.

What I found rather disturbing was what could only be called the homage paid to trendy postmodern scientific theories. Little comments recur; apparently Sagan's life is ripe for postmodern analysis. For a man who was absolutely faithful to the scientific method and actually took the trouble to outline versions of it in detail (even David Stove, the arch-positivist, refused to do that), I can only assume he would be upset that a biography about him pandered to theories that trivialise it.

Nevertheless these are no more than minor irritations in an otherwise interesting and very readable biography. I would recommend it as of general interest to the skeptic and scientist alike. Anyone with memories of Carl Sagan will find it a very nostalgic account of his remarkable life and career.

Problems with posture

Laurie Eddie

The Posture Theory, by M.A. Banfield published by M.A. Banfield, 1997, 8th edition Adelaide. Copies are available directly from the author at Unit 6, 6 Hartman Avenue, Modbury South, S A, 5092, phone [08] 8263 5735. Cost \$46.50 plus \$6.50 postage.

This book appears to have been comprehensively researched, possibly too extensively, since many of the sources from which the author quotes are superficial and are extremely suspect, suggesting that, in his desperation to find material supporting his theories, he was prepared to use anything, no matter how insubstantial it might be.

Essentially the author's objective is to prove that:

... poor posture is the major, previously unrecognized cause of the symptoms of hypochondria. [p. 16].

Claims such as:

... there is clear evidence that the extreme symptoms of hypochondria and hysteria in the latter half of the nineteenth century were due to abdominal compression caused by the extremely tight whalebone corsets being worn in combination with bustles and heavy frocking ... [p. 17],

are repeated throughout the book. It is the claim of the author that hypochondria is an important component of many aspects of ill-health, and that the extensive range of physical disorders in which it is manifested are all caused by:

... poor posture, and tight belts, corsets, or pregnancy, and electrocution ... [p. 211].

One initial problem is that the author fails to adequately explain that when he refers to "hypochondria" he is using the term in its original context, rather than in its more commonly accepted modern meaning. He does mention, briefly, in his Introduction, that, to the ancient Greeks, *hypochondria* referred to a variety of disorders experienced in those organs which lay beneath the rib-cage, (*hypo* = beneath + *chondros* = cartilage - of the ribs). In more recent times however, the term has come to be more synonymous with "a chronic, abnormal concern with the health of the body." (*Mosby's Medical and Nursing Dictionary*), a form of neurosis, in which the patient may actually manifest physical symptoms appropriate to specific disorders, even when such disorders are imaginary.

The author has a marvellous ability to see poor posture and compression of these organs as the principal cause of almost every physical ailment in modern Western societies. To this end he examines virtually every conceivable physical health disorder, attributing each to one or the other, or a combination of these two factors. He claims that these idiosyncrasies contribute to a condition called visceroptosis, (a medical term now rarely used), where the internal organs "are displaced downwards." [p. 172], and that this displacement, produced by poor posture or restrictive clothing, is the

principal contributory agent in all of the ailments which occur in these organs.

Such a theory is fraught with many difficulties. The main problem is that while this idea was proposed by a number of 19th century doctors, like so many "scientific" theories of that era, it has been almost totally rejected by modern medical authorities. So, with virtually no modern research on this subject, the author has to rely upon "research" and miscellaneous publications from the 19th and early 20th centuries, and he uses these to fill his book, using an enormous number of direct quotations from such sources. However, there is a problem — not only are these sources rather obscure, but their reliability as material upon which to build a theory, is highly questionable.

Many of the so-called "medical" sources, such as, *The Ladies Guide*, [1904]; *Jack's Reference Book*, [1908]; *The Doctor at Home*, [1910]; *Ruddock's Homoeopathic Vade Mecum*, [1914]; *The Modern Family Doctor*, [1928]; and, *The Nervous Child*, [1930], were obviously designed for domestic use. Even worse, very few of the old medical ideas of such publications have survived to the present.

Even one as "recent" as 1944, the *Textbook of Obstetrics and Gynaecology* would now be almost completely redundant, since it predates most of our modern ideas of medicine. In 1944, penicillin remained relatively unavailable to the general public, while modern medications, especially psychiatric medications, as well as the new technology, such as ultrasound, and modern computerized exploratory equipment, had yet to be developed.

There are also major problems in comparing health problems in different eras. Despite the best statistical material, we cannot really hope to know how endemic were the effects of the past environment. Ordinary folk lived amid a cesspool of environmental pollution; materials now known to be extremely noxious were commonly present in their daily-life. Chemical waste went straight into the rivers that supplied their drinking water; they worked in factories totally unprotected from chemicals, and other deleterious materials. They lived in cramped, damp houses, and the streets, where their children played, were flowing with industrial discharges.

Starvation and malnutrition was rife, their food was of poor nutritional quality, and deficiency diseases such as rickets were endemic. Even the wealthy lived in conditions which would not be tolerated by modern health authorities. While we do not know how much illness can be attributed to such conditions, we do know that since the environment has improved, many of the diseases which the author attributes to hypochondria, have almost disappeared.

The author is rather fixed in his attitude perceiving the "downward pressure on all the internal organs ..." [p. 31] from poor posture and constrictive clothing as

the ultimate cause of physical health disorders. To this end he seeks clues in the most abstruse locations, even seeing evidence in various pictures and illustrations - an extremely suspect method of diagnosis. He suggests that the stooped posture of Darwin, "... was the cause of his health problems." [p. 102], and that a portrait of Howard Hughes indicates "curvature of the spine." [p. 242]. In a drawing of the Hospital of Salpêtrière, several pedestrians can be seen walking on sticks and crutches, and he concludes they are that way because "... the corsets crippled their spines and bodies." [p. 137]. The fact that they may have had other ambulatory disorders is conveniently overlooked. The Salpêtrière housed a wide range of patients, including those with broken limbs, and one must ask, could broken legs be caused by tight corsets?

Likewise, in the well known painting, *Le Leçon clinique du Dr. Charcot*¹, where Charcot is shown holding an unconscious woman, the author concludes that the woman was wearing a corset and attributes her condition to fainting, caused by compression of her abdomen, [p. 136]. He ignores the fact that this woman was apparently one of a small number of female hysterics, residents of Salpêtrière, whom Charcot, at that stage of his career, used in his lectures to "prove" his theory that only hysterics could be hypnotized.

Unfortunately, not only was his theory wrong, but his research was seriously flawed. He had too small a sample (3 patients), and Charcot himself never hypnotized these female subjects. This was done by assistants, who aware of Charcot's theories often "prepared" these subjects to respond as they thought he would want them to perform². Not only that, but, believing hypnotized patients were "unconscious" and unable to hear anything, Charcot freely discussed his ideas in front of the patients, not realizing that they heard every word he said. How much they were influenced to act out his ideas we can only guess?

While much of the hysteria displayed by Charcot's patients was probably genuine, it appears very likely that there was also considerable "acting". These patients may have been deranged but they were not stupid; they had a gullible audience of medical students, and since they were expected to "perform" no doubt they probably did so. The better the performance, the more attention they received from doctors and staff, in their own way they were "celebrities" and they probably received other forms of rewards. Corsets had nothing to do with the phenomena.

Just as Charcot's ideas were based upon an erroneous assumption, so too are the theories expounded in this book. The fact that, by the early 20th century, a number of authors had noted that the more severe forms of hysteria which Charcot had frequently witnessed, no longer existed, has nothing whatsoever to do with corsets, rather it was indicative of the enormous social change which took place during the previous half-century.

Furthermore, such claims completely ignore the complex issues relating to what were "normal" levels of social hysteria. Over the centuries humankind has experienced many forms of collective hysteria. In the collective hysteria which swept Europe in the forms of the dancing-manias and witchcraft, hundreds of thou-

sands fell victim to hysteria. We can now appreciate that there were powerful social and cultural elements in such episodes, and, indeed, the author even alludes to social factors being a contributory aspect when he mentions that 19th century observers themselves noted that the incidence of hysteria was greater amongst English women than it was amongst French women, [p. 156]. Perhaps there was, and remains, a French preoccupation with hysteria; interestingly, while, "...French psychoanalysis has remained faithful to hysteria over the years ... the subject hardly features at all in the English language journals."³

Much of this behaviour was related to 'social-expectations'. Thus, fainting, once a very acceptable female behavioural trait, could only exist in a society which believed that women were frail, easily perturbed, creatures. Yet fainting was restricted to certain classes. It was rare amongst ordinary working women, they had no time for such nonsense, and besides, they could be sacked if they fainted at work. Likewise, amongst dominant women, like Florence Nightingale and Emily Pankhurst, who refused to conform to accepted social criteria, it was unknown. One only has to compare the widespread frequency of females fainting in the 19th century with its rarity amongst modern women to see that powerful social factors underlie such behaviour.

Such is the level of the author's dogmatism that he repeats the rather absurd claim, put forward by John Bulwer in his book, *Anthropometamorphosis*, [1650], that women who wear tight corsets "... open a door to Consumptions and a withering rottenness." [p. 510]. This author rationalises that such practices "crushed the bowel" [p. 425], making one susceptible to infections such as TB and typhoid. Yet, the fact is, once the bacteria which caused typhoid was identified, and health authorities treated the water supplies, typhoid almost disappeared! Similarly, despite changes in clothing styles in the 20th century, TB continued to be a health problem until medicines were developed to control it. The fact that it is re-emerging probably has more to do with poor standards of health than tight jeans.

The section on shell shock I considered superfluous. It dealt with the subject too superficially. The author's claims that such trauma was primarily attributable to "shockwaves" [p. 324], and that contributing factors were the soldiers' "... thin chest, tight clothing, heavy knapsack and unaccustomed effort ...", [p. 328] are quite incredible. The author completely overlooks the psychological factors, the mental stresses, the fear and frustration which would have contributed to the disorder. Not everyone can withstand the intense physical and mental demands placed upon a soldier in a combat situation. The term, "shell-shock" which was introduced when the problem was little understood, and simply attributed the problem to percussion, is outmoded, the term, "combat fatigue" is a much more appropriate description of this health problem.

Overall, while I found this an interesting book I believe that the author has erred in attempting to attribute every physical disorder to the physical aspects of visceroptosis. His conclusions that psychological factors

Continued p 63 ...

The charm and strangeness of a great mind

Rob Hardy

Strange Beauty, George Johnson ; Alfred A. Knopf, NY, 1999

With the publication of James Gleick's fine *Genius*, we had a great biography of Richard Feynman, who can truly be called one of the architects of modern physics. We had no biography of his partner, rival, and antagonist, Murray Gell-Mann. George Johnson, a science writer for the *New York Times*, has now remedied this in a great biography, *Strange Beauty*.

Johnson has the formidable task of making readers appreciate the importance of Gell-Mann's contributions to fields that, even though they are basic to every particle of the universe, most people will not come close to understanding. He shows the science adequately well, although as a layman in the field, I can only tell you that that he seems to make sense of some of the complexities and counter-intuitive paradoxes of the subatomic realm, which for me is going to remain forever beyond comprehension. What Johnson does do, and wonderfully well, is to make sense of Gell-Mann's life and personality, and give the story a universal appeal that the intricacies of the science cannot have.

Someone (it isn't quoted in this book) said that Gell-Mann didn't have one brain, he had twelve, and each of them is smarter than yours. Where Feynman was brilliant in his one field, Gell-Mann had an encyclopedic mind and memory. He remembered the result of every experiment he heard about and the details of any paper he had ever written. He could pick up languages as easily as the rest of us might learn a new route to the grocery. One time a colleague was amazed to see Gell-Mann pick up a book on the ancient Devanagari alphabet, scan it for a few minutes, and then write down all the characters from memory. Gell-Mann loved showing off his knowledge not just in physics and languages, but in archaeology, literature, and ornithology as well. Some loved the treat of such demonstrations, but others found them annoying. A fellow physicist who had been an eager bird-watcher became annoyed that Gell-Mann would tell him the name of every single bird they encountered during a walk; he was so irritated that he gave up bird-watching, insisting that all birds looked to him like ducks.

Gell-Mann graduated from High School at age fourteen, and zipped through college and his doctoral program with the same precocity. His peers were always amazed that he didn't spend much time studying, but that he must have really crammed in his previous years to stock his storehouse of facts about physics and odd arcana. It wasn't so; he just seemed to have been born knowing lots of stuff.

Others noticed that besides having a prodigious memory, Gell-Mann was simply smart. He had an astonishing facility for adapting mathematical ideas to theories of physics. He was not an experimenter in the

least. It was his happy fortune to be working in a time when theorising, not experimentation, was blazing the trails in physics. He came up with classification schemes of particles and gave them new numbers with odd names like charm, top, and strange. Then, as particle accelerators became more powerful and the ability to see detail within the atomic nucleus increased, the experimenters would indeed find the particles his theory had predicted. They would send him the pictures, and he would decorate his walls with them.

Particle physics was an intensely competitive field; attacks by one physicist on the ideas of another could be vicious, and there was enormous pressure to be the first to publish ideas. Gell-Mann's tendency toward procrastination repeatedly hampered his being the absolute first to publish a finding, but his love of language will make his contributions seem even greater than they really were. For instance, the more detailed histories of physics will record that it was not only Gell-Mann but also his colleague George Zweig who first theorised the building blocks of matter Gell-Mann christened quarks. Zweig called them "aces," but Gell-Mann's weird word stuck.

He liked to point out that he had invented the word, a tweak of "quirk," and that it was wrong to say that it was taken from James Joyce's *Finnegans Wake*. Gell-Mann had the word already, when, browsing as he did through Joyce's complexity of puns, he found the line: "Three quarks for Muster Mark." Gell-Mann liked the "three" connected with quarks (which subsequently were found to be a little less triadic), and the drinking pun on "quarts," and also that "quark" was a smelly cheese in Germany, thence a term for "nonsense."

For all of Gell-Mann's aggressiveness, he was initially tentative about his invention. Gell-Mann thought of quarks as mathematical entities, almost like Platonic ideals, removed from physical existence. They were not tiny building blocks, but patterns and symmetries. Part of this tentativeness was that of the theoriser as opposed to the experimenter (although experimenters have subsequently demonstrated the physicality of quarks).

Part of it was that Gell-Mann had an enormous insecurity and worried always about being shown to be wrong. He was able to dish out criticism, but turned irascible when it was directed in his way. Few could stand up to him, but Feynman always did; everything bothered Gell-Mann and nothing bothered Feynman. Students loved asking Feynman questions, but worried that a question to Gell-Mann would get nothing but a withering reply. Feynman loved teasing Gell-Mann at seminars, and Gell-Mann would strike back by quizzing Feynman on something outside of physics, and outside of physics, Feynman was vulnerable. Attacked on, for instance, the etymology of the word "dollar,"

Feynman replied, "Murray, in a hundred years, nobody will know whether your name is hyphenated or not." The unflappable Feynman had hit on a peculiarity that others mistakenly attributed to Gell-Mann himself. His odd hyphenated name was taken by many as Murray's own snobbishness, but it was an invention of his father. His brother has taken the less pompous, original, Gelman.

Gell-Mann seemed to show off because he had trouble accepting that people could like him for what he was and not what he knew. His insecurity was also reflected in his procrastination; from serious papers to his popularisation *The Quark and the Jaguar*, Gell-Mann had trouble with the written word. He could do physics in his head while hiking, for instance, but sitting in front of a blank piece of paper reminded him that he just knew too much. Instead of written thoughts, he would agonise over etymologies or exactly what level of detail to dive into. His worries caused him loss of some claims of priority, and were often paralyzing; he didn't even get his Nobel lecture written up in time for it to be included in the prestigious volume put out by the Swedish Academy.

Gell-Mann's wide-ranging curiosity stood him in good stead after winning the Nobel Prize in 1969. Prize winners are called upon to give lectures, serve on committees, volunteer for directorships, even outside of their areas of expertise, but Gell-Mann had few such areas. As his work in physics wound down, Gell-Mann has been able to work on various environmental projects and served as a regent of the Smithsonian. In 1986 he personally recruited seventy-two Nobel laureates to oppose the teaching of creationism in schools. He cooperated on this fine biography, which is respectful, admiring, but far from blindly devoted. Now at seventy years old, his memory isn't as good as it used to be, and he can't follow all the math of the superstring theories born of his own ideas. He might be less smart than he used to be (but then again, he had twelve brains to begin with), but it seems he is more at peace with himself and his competitors. He should be proud of the work described in *Strange Beauty*, and he can also be proud of being the subject of such a model scientific biography.

... Posture from p 61

make no contribution to such disorders are speculative. While his claim that, "... there has never been a satisfactory way of explaining how an emotional disturbance could cause the range of symptoms" [p. 97], is inherently correct, there is however a vast range of research literature which demonstrates some form of causal connections.

One should never forget that for many decades the relationship between smoking and the incidence of cancer was widely accepted, despite the fact that there was no actual physical evidence. Proof had to wait until improved scientific methods could demonstrate the complex physiological processes involved. Likewise, stress from a wide range of sources is an integral part of all human life. Its manifestations, in many forms of the so-called "neuroses" closely parallel the various symptoms of hypochondria and hysteria.

I have little doubt that visceroptosis may cause malformations, but, as medical records show, humans are remarkable adaptable, they can adapt their bodies to the most incredible conditions. On that basis it would seem rather likely that in most examples of visceroptosis, our internal organs, which are remarkably supple, would simply adapt and continue to function normally.

If anything the book serves to show the credulity of humans in their willingness to accept clothing styles which are not simply uncomfortable, but often dangerous to health. Unfortunately, fashion appears to remain beyond the realms of common sense, and considerations such as whether clothing is comfortable or restrictive continue to be ignored as individuals follow peer-group pressure as the principal factor in what styles of fashion they adopt.

Notes

1. Literally Dr. Charcot's clinical lecture.
2. Sheehan, P.W. and Perry, C.W. (1976). "Historical antecedents and perspectives." In P.W. Sheehan and C.W. Perry, *Methodologies of Hypnosis: A Critical Appraisal of Contemporary Paradigms of Hypnosis*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.
3. Halberstadt-Freud, K.C. (1996) "Studies on hysteria one hundred years on: A century of psychoanalysis." *International Journal of Psycho-Analysis*, 77, 983-996, p. 990.

A good fun read

Barry Williams

Lucky You, Carl Hiassen, Pan MacMillan Australia, 1997. pbk

We don't often review or recommend works of fiction in *the Skeptic*, particularly not genre fiction, but sometimes we come across a book that we think would appeal to Skeptics everywhere. One such book is *Lucky You*, by Carl Hiassen, an American crime writer, whose books are set in his native Florida and are usually concerned with those things peculiar to that part of the USA: rabid developers, drug dealers, corrupt politicians, and so on. Despite the serious themes, and the violence inherent in such activities, Hiassen writes with

a great deal of high-spirited good humour and all of his books are easy to read.

Lucky You follows the fortunes of two winners of a very large state lottery and the threats and chicanery that surround them, but it is the mileu in which each of their lives which makes this a gem for a Skeptic. One of the winners is a racist bigot who desperately wants to form his own militia and is a follower of every New World Order and similar conspiracy theory going.

The other winner is a pleasant lady who lives in a small town whose major industry is religious imagery (weeping Madonnas, stigmatic carpenters, images of Jesus in hydraulic oil spills) designed to attract tourists on pilgrimages. In the midst of this is the protagonist, an honest journalist who works for a sleazy tabloid newspaper.

This book is immense fun, covers themes of interest to all Skeptics, and is highly recommended.

Radiation dangers

I read *the Skeptic* religiously (though I shudder to use that word in this company) and I have not previously been moved to put pen to paper. However, the combination of a review of Steven Pinker's book in issue 19:2, and in issue 19:3 an article on radiation and a letter from Soressa M Kitessa discussing an article on 'Afrocentric' linguistics have been enough to cause me to try and express a rather deep disquiet with some of the content of *the Skeptic*.

I consider skepticism to be a word describing a type of world view in which every claim made, by any person, is looked at critically. The question us Skeptics ask ourselves should be: "Is there any evidence to support this claim?" In my opinion, the use of coronary artery bypass surgery should be examined in the same way as the use of echinacea, and claims to have seen a UFO should be judged using the same criteria as claims to have discovered a photon which no-one can see.

My disquiet comes from a feeling that, in *the Skeptic*, claims from "orthodox" sources are not put to the same test as those from less traditional sources. Soressa M Kitessa, in her letter in issue 19:3, eloquently argued a similar point about Mark Newbrook's article on a linguistic theory when she reasoned that just labelling a theory "fringe" is not an appropriate criticism.

The review of Steven Pinker's book in issue 19:2 was one of the things in recent issues of *the Skeptic* which worried me. I read Pinker's book *The Language Instinct* with awe and was looking forward to his next layperson's book but after I read Margaret Wertheim's review in the *Australian Review of Books* I decided it probably wasn't worth the money. She argued that Pinker was fine when he stuck to his own discipline (linguistics) but once he got into broader topics he started making grand claims with no documented evidence to back them up. This is the review of a true skeptic who asked, "Is there any evidence to support this claim?" all the way through the book. In contrast, the review in *the Skeptic* was almost embarrassing in its uncritical acceptance of everything said in the book. If

books like *The Liver Cleansing Diet* can be critically reviewed (*the Skeptic* 19:3) why is it that a book from a more traditional source doesn't need the skeptical approach? Although I haven't read the book and cannot comment on the accuracy of either review, my argument is that the approach of only one of the reviewers was demonstrably skeptical and that reviewer wasn't the one published in *the Skeptic*.

However, it was Colin Keay's article entitled "Arsenic and radiation" which really spurred this letter. I recently stopped subscribing to a peer-reviewed journal in my field after it published an article which purported to be scientific but only presented evidence for one side of an argument (fluoridation of water, as it happens). As any scientifically literate person knows, any scientific question has two sides and the art of a good review is to present a balanced view of both sides. Keay's article certainly did not do this, and did not approach its subject with any hint of skepticism that I could detect. So much for general criticism, my specific problems with this article were as follows:

1. The statement that "Australian have never been healthier; thus the average of 2.3 mSv per year is evidently not doing us much harm." is a totally non-falsifiable statement. I could just as justifiably say that "Because we don't live to 200 years old, the average of 2.3 mSv per year is obviously very harmful". Neither are valid arguments.

2. In a well designed experiment on the effect of low doses of radiation, we would randomize groups of people to various doses, follow them for a number of decades and see who develops cancer. However, studies of humans are often dependent on "accidental experiments" since we can never submit human subjects to substances which are possibly harmful. The problem with these accidental experiments is that we cannot choose how many people are exposed to each dose of the substance under investigation and we cannot ensure that all groups are equal with regard to other findings. Because the radium dial studies are based on observational studies, the controversy about the exact dose-response relationship in the radium dial painters continues (1,2) and cannot be dismissed as casually as does Dr Keay.

3. Studies of workers exposed to radiation material are, along with all

studies of occupational groups, subject to the "healthy worker effect". This results from the fact that people who get jobs tend to be in good health. When we compare them with the general population which contains people who are in hospital, people with mental and physical illness and people with risk factors such as alcoholism and homelessness, of course the employed people are more healthy. I am not sure which of the many studies of plutonium workers Dr Keay is alluding to in his article, but I would want to look at the comparison population before believing his claim.

4. Cancer is not a disease, it is a group of different diseases which it suits us to group under one name. However, we know that the carcinogenic effect of a particular substance, if it has such an effect, is most likely to be confined to one or two of the many diseases grouped under this heading. To state that the "survivors of the Hiroshima and Nagasaki bombings show clearly that there was no increase in the normal number of total cancer deaths over nearly half a century" misses the point. This is an extremely closely followed cohort, and there may well have been early detection of cancers resulting in a decreased number of deaths overall. A better measure of the effect of any substance is the number of new cases rather than the number of deaths, as deaths are affected by the quality of medical screening and treatment. My point here is that Dr Keay has selectively quoted one finding of the studies from this group (all-cancer deaths) when quoting incidence rates of specific cancers shows that incidences of several different types of cancer have increased. (Even a cursory look at the literature disclosed that there are increases in at least primary liver cancer ³ and meningioma ⁴). In fact, latest reports show there is an increase in all-cancer deaths in this cohort anyway ⁵ which just goes to show how marked the effect is. (The increases were due both to leukaemia and solid tumours.)

5. Similarly there is evidence of substantially increased thyroid tumours among children in Chernobyl areas ^{6,7} and suggestions of thyroid cancer increases among workers who cleaned up after the accident ⁸. This is not mentioned by Dr Keay who just states that "the only major effects that could be clearly identified were those due to the anxieties of the general population". Thyroid cancer is a serious disease, particularly in children, and

could not possibly be thought of as just an anxiety effect.

6. Generally the statement that a little radiation has beneficial qualities is poorly argued. Most of the references come from politically motivated or self-published books and, given time, I am sure I could find some evidence for exactly the opposite point of view.

To sum up, I found the article by Dr Keay almost totally lacking in the skeptical approach I expect in *the Skeptic*. I would have welcomed an unbiased article on the topic of radiation, as I feel it is a confusing area with many strongly held points of view and, personally, I am not sure what to think. But articles which present only one side of the story have no place in *the Skeptic*.

I would hope that a stronger editorial line would be taken in future, and biased articles which only present one view would not be published unless rewritten in a more skeptical tone.

Lin Fritschi Melbourne

1. Carnes *et al*; "Radium dial workers: issues concerning dose response and modeling", *J Radiat Res* 1997;147:707-714.
2. Stebbings JH; "Radium and leukaemia: is current dogma valid? ", *Health Phys* 1998;74:486-8
3. Cologne JB *et al*; "Effects of radiation on incidence of primary liver cancer among atomic bomb survivors", *J Radiat Res* 1999;152:364-73
4. Shintani T *et al*; "High incidence of meningioma among Hiroshima atomic bomb survivors", *J Radiat Res (Tokyo)* 1999;40:49-57.
5. Pierce *et al*; "Studies of the mortality of atomic bomb survivors. Report 12, Part 1. Cancer: 1950-1990" *Radiat Res* 1996;146:1-27.
6. Jacob P *et al*; "Childhood exposure due to the Chernobyl accident and thyroid cancer risk in contaminated areas of Belarus and Russia", *Br J Cancer* 1999;80:1461-9.
7. Heidenreich WF *et al*; "Time trends of thyroid cancer incidence in Belarus after the Chernobyl accident", *Radiat Res* 1999;151:617-25.
8. Ivanov VK; "Thyroid cancer among 'liquidators' of the Chernobyl accident" *Br J Radiol* 1997;70:937-41.

Colin Keay responds

I am sorry Dr Lin Fritschi feels that my article is biased and has no place in *the Skeptic*. Of course it was biased, but in the direction of skepticism.

It was intended to counter the deluge of misinformation and lies flooding the media from more than a dozen organisations determined to slander nuclear energy and its fuels. Public fears of radiation have been whipped to a frenzy with no regard for reality. And the reality, as I tried to point out, is that radiation, up to levels about twenty times our average exposure, is not a serious danger to humans.

There is a growing awareness among the experts that their conservative approach to radiation safety has caused more alarm than the protection intended. So much so that Roger Clark, Chairman of the International Commission on Radiation Protection, in an article "Control of low-level radiation exposure: time for a change" (*J Radiol Prot.* 1999, vol 19:2,107-115) advocates changing the radiation exposure limits to what he calls 'action levels'. Instead of creating alarm if the limits are even slightly exceeded, the new term gives a warning that something should then be done to reduce exposure - a much more realistic attitude and less likely to be misunderstood.

I thank Lin for drawing my attention to some recent papers on the subject, many of which are dated after I wrote my article. If, as the papers apparently indicate, significant disability is now appearing in atomic bomb survivors after more than half a century of generally excellent health it will not be surprising, provided they are the ones who received a high radiation dose from the bomb in the first place. They were well down the harm slope of my toxicity graph.

As for the Chernobyl 'rectifiers', they need to be compared with a matched cohort of middle-aged Soviet men who were not involved in cleaning up the radioactive mess, as Lin Fritschi would agree. I think the jury is still out on that one. My article was intended to show that a skeptical approach is needed to counter the prevalent alarmist claims about radiation.

I stand by the major thrust of my article. The details we may argue for ever.

Colin Keay

The Editor responds

We would certainly hope that all orthodox scientific theories had been subjected to properly skeptical scrutiny and debate before they became accepted, however, we do not believe that *the Skeptic* is the proper place for those debates to take place. Professional journals exist specifically for that purpose and they are the proper fora for this type of discussion, not least because that is where all the readers are likely to have sufficient knowledge of the subject to be able to understand the technical arguments.

The Skeptic takes a broader position. Our audience, composed largely of people who are scientifically literate, also has many who are also scientific-

ally qualified, but only a very small number have qualifications in any particular discipline. Thus, for any specific topic, the audience is very largely a lay one, albeit intelligently so, and writers should take that into account.

There is no *Skeptic* party line nor dogma to which authors are required to adhere, as should be obvious from the diversity of opinions that appear in our pages. Nor do we believe that there should be, as any such line would necessarily be restrictive of critical inquiry and informed debate.

We expect our authors to respect the conventions of the scientific method and rational argument. While they should not engage in the highly technical arguments more suited to their professional journals, it is entirely appropriate that we publish articles that challenge "media orthodoxy".

By which we mean the sort of simplistic and emotive positions taken towards complex issues in the popular media, presumably because they regard their readers/viewers as being too dim to understand anything that cannot be encompassed by a slogan. The nuclear energy debate is a prime example of this, with the commercial and political agendas of its proponents and opponents leaving little room for informed debate on this complex and important issue.

We do not treat our readers like that, as we believe that they are very capable of understanding well-reasoned argument and quite complex scientific propositions, without needing to resort to instant (and often uninformed) opinions.

We are more than a little bemused by the suggestion that only "balanced" articles should be presented in *the Skeptic*. We can think of few recipes more guaranteed to induce catatonia in our readers, nor one less conducive to generating informed debate. The balance comes through the *Forum* and *Letters* columns and this *Forum* is testimony to that.

We welcome correspondence from anyone who disagrees with any of our authors' expressed opinions. We do suggest, however, that such correspondence be kept concise and cogent (ie, a 20 page rebuttal of a one page article is unlikely to be published).

It is a curious fact that while certain issues of importance *do* generate a fair amount of mail, the record is still held by that in response to an article on the direction water spirals down the plughole in either hemisphere.



Colloidal silver

On p10 of 19:4 you express doubts about the use of colloidal silver as a bactericide. I have also seen similar comments in electronics magazines.

While I am no supporter of magical electronic devices claiming to produce this or anything else, I am sure that the substance itself has been of enormous medical value before the arrival of antibiotics. (Indeed it may well be needed again when more bacteria have developed antibiotic resistance.) It was first made by Bredig in the 19th century by the method he invented, and used to make colloidal dispersions of many metals: by striking an electric arc between two metal electrodes under water. Later various techniques were found for preparing it by chemical reduction of silver salts.

It is a dispersion of extremely fine particles of metallic silver in water, with some protein material to stabilise it. Why should this be a bactericide? Silver metal in its normal state is very inert; hence its use for table cutlery; it never hurt anyone. But silver ions have powerful biological effects: silver nitrate in very dilute solution is a strong bactericide, and at higher concentrations will burn and corrode living tissue. Hence its old name "lunar caustic".

As a young man I had an outbreak of a rare skin disease, granuloma annulare, on a knuckle. The effective treatment in 1938 was to burn it off by rubbing it with a moist crystal of silver nitrate: it never recurred. Because of the danger of using at too high a strength, silver nitrate needed great care in its use.

Colloidal silver, because the silver particles are so finely divided, does react weakly with water to produce traces of silver ions, enough to be an effective bactericide without the caustic action. My *Encyclopaedia Britannica* (1967 ed.) says:

"Babies' sore eyes, or ophthalmia neonatorum, acquired from gonorrhoea organisms in the birth canal of the mother, was a major cause of blindness in children in the early years of the 20th century...responsible for approximately 30% of blindness among children entering schools for the blind in Great Britain and the United States... The use of silver nitrate drops in the eyes of infants immediately after birth was introduced and compulsory immediate reporting of babies' sore eyes

We welcome letters from readers on Skeptical topics that might be of interest to other readers.

We reserve the right to edit such correspondence for reasons of clarity, brevity or the state of the Editor's liver.

was required so that adequate treatment would be assured. By 1955 the number of cases of ophthalmia neonatorum among new pupils in the USA was reduced to 0.1%. In Britain after 1945 and Denmark after 1934 it was zero."

In fact I recall from other reading that colloidal silver, often under the trade name Argyrol, was often the treatment of choice. So we should not lightly dismiss an old-fashioned remedy that saved millions of children from blindness.

**Robin Stokes
(Emeritus Professor
of Chemistry)
Armidale NSW**

Thanks for the reminder Professor Stokes.

We were aware of the valuable use to which colloidal silver had been put in the past, before better techniques became available. In the article, our complaint was with the purveyors of gadgetry for which unsubstantiated claims have been made about their ability to produce it.

We should have made our point clearer. Ed

Ritualistic cannibalism

Richard Buchhorn's *Forum* article on cannibalism in your last issue (19:4) is a well researched critique of alleged recent episodes of cannibalism, and a persuasive polemic about how easy and tempting a slur it is to make against cultures one finds strange or threatening.

I'm puzzled, though, as to why Richard didn't include in his piece any discussion of the central ritual of Christianity, namely the consumption by the faithful of the body and blood of

Christ, with its attendant implications for the common cultural history of humankind.

Admittedly, within Protestant tradition this practice has become entirely symbolic, but as a young Catholic I was taught that the transubstantiation of bread and wine into the flesh and blood of Christ was a literal truth, and that eating the communion host was to be taken as a literal consumption of Christ's body, with the consequent sharing of his 'divine grace'.

Later on I learned that Christianity had borrowed wholesale from, or imposed its particular ideology on, earlier pagan rites, such that the Eucharistic feast was simply a later version of the ancient agrarian rite involving a sacrifice, human or other, aimed at the regeneration of natural forces.

In its most explicit form, the ritual involved the leader of the community considered as the incarnation of a god, being put to death after reigning for a prescribed period, and dismembered. His various parts were distributed and eaten as a charm that passed on his divine qualities.

Many readers will recognise this theme as the central premise of Sir James George Frazer's monumental work, *The Golden Bough*. The above summary, however, comes from A L Lloyd's *Folk Song in England* which contains a gripping discussion of how remnants of the king-eating ritual survive, albeit in attenuated and less bloody form, in such ancient songs as *The Cutty Wren* and *The Herrin's Head*.

Having read both these books, and much more on this fascinating subject, I have never had any difficulty in believing that it was a feature of many or all early human cultures to practise cannibalism; not, as in Richard's words, as "an approved customary practice", but as a vital and momentous occasional ceremony whereby one might ingest some of the powers of the king, or an enemy, or a powerful animal. Isn't this why certain cultures or sub-cultures even today believe that the ingestion of rhinoceros horn, for instance, will bestow on whoever consumes it something of that fearsome animal's potency?

I'd be very interested to hear Richard's thoughts on this.

**Annie Warburton
North Hobart TAS**

A sigh for psi

I find Damien Broderick clutching at straws in his article "Through a Skeptical glass darkly" (*the Skeptic* 19:4) criticising my six-year-old review of his book *The Lotto Effect*.

Taking his straws in turn I don't see how a reviewer of a different book seeing Broderick in a different light to me has much relevance. I have no problem in scientists such as Dr Isaac Asimov writing science fiction as they will know the difference between science and fiction. I rate H G Wells' *The Time Machine* the best science fiction I have read. He would know the difference as he started as a qualified science teacher. As I state in my article "Karl Popper's Improper Science" the normal way to understand science is to study and then practise science.

Broderick suggests there is a scientific paper in support of his claim that "Psi (paranormal ability) has been detected in experiments at Cambridge's Cavendish Laboratory ..." and gives a website. This website is about Jacques Benveniste's homoeopathy claims which a scientific team (which had James Randi as a member) failed to validate. Broderick falls into the common non-scientific error of giving more validity to reputation, ie Cavendish Laboratory and Nobel Prize laureate Josephson, than evidence. Broderick's excuse, for the down-rating by a statistician of a Princeton psi probability initially claimed as representing a chance of 1 in 5000 to 1 in 19, is that traditional statistical methods were initially used. However, a scientist would have concluded that the later statistic was more correct and meant the result was not really significant in supporting psi.

I believe now that I may have misjudged Broderick when reading his chapter "Spooks and Kooks" but I still consider he did not sufficiently discount psi claims of such 19th century charlatans as D D Home.

Broderick is wrongly abusive of James Randi when he claims the four rules for psychics as being Randi's. Randi clearly states "Generations of exposure to the so-called 'psychic marvels' have allowed us to be talked into certain beliefs that have become firm rules by which it is thought psychics must be judged. Why this is so, I cannot fathom." (p. 11 *The Magic of Uri Geller*, James Randi). Broderick is niggly when he castigates Randi for

statistical ignorance for not telling the difference between "four to one and five to one."

Broderick regards "the accumulated evidence for psi as somewhat convincing ...", but fails to provide in his book any evidence to convince. His lack of understanding of the scientific approach and bias is shown when he changes the objective of CSICOP and the Australian Skeptics from "scientifically investigating claims of the paranormal" to "debunking claims of the paranormal". Any debunking of any paranormal claim may occur after an investigation reveals the falseness of the claim. It is not our aim to debunk. I tried to find the "tasty bit" of paranormal work reported by Broderick as recently done by Dr Dean Radin and Professor Dick Bierman at the web site he listed but found nothing there.

The experience of Skeptics here and worldwide is that there are fashions in paranormal claims. Telepathy may be in for a few years but when investigations find no evidence another paranormal area erupts. Psi seems to have bottomed in recent times.

**James Gerrard
Kew VIC.**

Divine proof

Notwithstanding Hume and Kant both showing that "it is impossible to prove or disprove God's existence", there is an acceptable proof - the existence proof.

The question "Is there a God?" is similar to "Is there a zebra?" or "Is there a unicorn?" If you can actually produce a zebra or a unicorn, you have your proof. If you search all over the world for centuries for a unicorn, and all you find are pictures of knights riding armoured horses with manufactured metal horns, then you have no disproof, merely some evidence for the non-existence of unicorns. (Probably even evidence beyond reasonable doubt, but still not the real thing.)

God's existence would be similarly provable, except for the difficulty of finding a being who is by definition unable to be seen, heard, touched, tasted or smelt. Much harder than finding a unicorn. However, God's non-existence still is unprovable. So believers might be able to provide proof, while atheists can-

not, even though (in my humble opinion), atheists are more likely to be correct.

Thus confounded, I remain agnostic. (BTW, I looked up 'drow' in the Shorter Oxford Dictionary, and in fact it is an obsolete past tense of the verb 'to draw'. So I am a drowist, because I have drawn things.)

**Ben Morphett
Drummoyne NSW**

Defining faith

Ruth Pihl in the article "A moaning and gnashing of teeth" (19:4, pp46,47) suggests that: "Belief without evidence is the basis of faith, a virtuous attribute where a person can put aside what he knows to be and believe something he knows not to be."

I'd always thought that faith was about believing in an outcome that wasn't yet known. My reading of Pihl would suggest that she's onto something. Fancy all the ministers, bishops, popes, gurus, imams, etc believing in something they know not to be, as opposed to hoping for something that they don't know the result of!

I realise this may be pedantry but there are important distinctions here. Think of all those poor Collingwood supporters with faith in their team. Well at least with the above definition they can keep their faith!

**John Paterson
North Carlton VIC**

Creating

In 19:3 Ken Smith looked in the wrong place in *Genesis* in quibbling about "forming" vs "creating". Yes, "yatsar" in *Genesis* 2:7 means "forming", but as Dr J.H. Hertz, once Chief Rabbi of the British Empire, notes in his commentary on the Pentateuch the word "boro" used in the first line of *Genesis* "is used only of Divine activity. Man is spoken of as 'making' or 'forming', but never as 'creating', ie producing something out of nothing."

The passage Smith quotes indeed is of a transformation from dust to humans, but he ignores the question of who created the dust and how this is worded in the original Hebrew.

**Gary Goldberg
Silver Spring, MD (USA)**

Christmas story

Just before Christmas I was walking with my wife through a store (which shall remain nameless) when she stopped and said "Now I've seen everything!" Looking over her shoulder I saw the object she was referring to - a packet described as containing "plastic crystals". They would certainly be as efficacious as genuine "crystal crystals", and at five for \$2 would be very much cheaper. So if your friendly New Age neighbour is complaining that crystals no longer seem to work, suggest they might like to try plastic ones.

My wife had been wanting a larger teapot for some time, to cater for occasions when our house was invaded by our children and grandchildren. I bought her one of the colour she wanted, and she was very pleased on Christmas morning to open the box. She put it down and picked up the box to add it to the pile of wrappings. The she said to me "Did you read what it said on the box?" I must admit that I hadn't - I tend to ignore manufacturers' blurbs. Printed in fairly large letters was "This tea pot creates a hypnotic ambience through a combination of semi-translucent colours."

So if you hear about funny things happening in the Smith household you will know that we've fallen under the "hypnotic ambience" of our new teapot.

Ken Smith
Graceville, Qld

Language in a twist

Mark Newbrook has his linguistics in a twist when he states that "Gerrand is right to say that specific first languages are acquired rather than genetically inherited;" (*Letters* 19:4). I stated the opposite. "This fluency [of an identical twin reared in a different environment] would be due more to his genes rather than his environment." As related in Matt Ridley's book *Genome* "... the tendency to develop language late has been demonstrated by twin studies to be highly heritable." "The evidence that a gene somewhere on chromosome 7 usually plays a part in building that instinct [for grammar] on the developing foetus, brain is good ..."

I have a six year-old grandchild who already shows a remarkable and apt

command of language which I believe is due principally to his genes (not necessarily from me!) and which his environment of television, videos, school and family has developed. Newbrook gives no evidence for his claim that my "treatment of the Mead-Freeman issue appears highly partisan and one-sided".

As a Skeptic/Humanist I am not a believer in saints ("...a saint, which is how Gerrand seems to see him.") but I do consider Freeman achieved a near miracle in producing the evidence to successfully expose the unscientifically based conclusions of the American icon, Margaret Mead.

James Gerrand
Kew VIC

Defending Chalmers

Scott Campbell's ludicrous attack on Alan Chalmers and his book *What is This Thing Called Science?* cannot go unchallenged.

Chalmers' book is neither irrationalist nor sub-Popperian, whatever that means (underneath Popper?). And nor is it, as Rafe Champion's original review contends, particularly Popperian. Campbell's other descriptions - 'quasi-Marxist' and 'at home in a radical sociology of science course' are laughable.

I recently sat through a seminar series on the book in which moderate sociologists and historians of science thought it far too realist. I suspect that Campbell has either

1. not read the book;
2. read it a long time ago and has since associated it with a highly demonised radical sociology of science; or
3. completely misunderstood the book.

Interpreting the book as anti-realist is like interpreting George Orwell's *Animal Farm* as a children's story.

Chalmers is anti-realist only in the sense that Plato is anti-realist. Both simply recognise that we access the world through our senses, and that direct knowledge of the world is therefore impossible. That is not to say that reality is an illusion, but that we have no absolute foundations on which to base a knowledge of reality.

There is no escaping the problem, but there are two possible strategies for dealing with it. One is to take it seriously and conclude that reality is not real (a wonderful contradiction in

terms). This is the course taken by psychopaths and some radical philosophers (though in the latter case - disingenuously - punch them in the face and see how real they think that is). The second strategy is simply to accept the problem but carry on regardless.

We obviously do have knowledge of the world, but how, fundamentally, we come to have it will always remain something of a mystery. Presenting the problem and concluding that there is no way of resolving it does not make one an anti-realist, just as those who point out the flaws in capitalism are not necessarily Marxists.

One of Chalmers' more interesting contributions (in the third edition) to the continuing debate over science and its foundations concerns scientific method. Science seems to give us special knowledge about the world, and yet no attempt to write down what it is about science that is special, no attempt to codify 'The Scientific Method', seems adequate. We might therefore conclude that there simply is no method. This is the conclusion, for example, of Paul Feyerabend (eg, *Against Method* 1975). A second interpretation is that we have simply failed so far in our quest to find the right description of science. Once we do, we will have a full codification of the scientific method. Both of these conclusions are implausible.

Chalmers gives us a third possibility. Feyerabend was right, at least insofar as there is no *universal* scientific method; that is, a standard that can be applied to all science and at all times. But that doesn't mean that science has no rational basis, nor that science is without method. Instead, different areas and eras of science have their own methods, applicable to their own areas of enquiry.

Method is contextual. Hence particle physicists do not use double blind experiments, whereas psychologists do. The standards applicable to one science may not be applicable to another, and yet both can produce reliable knowledge. This offers a realist and progressivist philosophy of science, but one that overcomes the standard objections to other realist philosophies.

If you want to know more, I suggest you read Alan Chalmers' excellent book, *What is This Thing Called Science?* Make sure, however, it is the latest (third) edition, which is major improvement on the previous two editions. It reflects the changes in

thought over almost three decades of one of the few remaining members of an almost extinct species - the historian and philosopher of science - and one who has now, sadly, retired.

David Roche
University of Sydney

Questioning Chalmers

David writes

Campbell's other descriptions -- 'quasi-Marxist' and 'at home in a radical sociology of science course' are laughable.

The later chapters of the first edition were explicitly derived from the repulsive Louis Althusser, who Chalmers himself described as a 'French Marxist'. (Chalmers also acknowledged Althusser's influence in the preface to the second edition). Althusser was the darling of the General Philosophy department at Sydney Uni in the early 1970's, until someone made the fatal mistake of going to visit him in France. When he was told of the Sydney interpretations of his work he disowned them. So exit Althusser as a role model for the department (especially when he killed his wife later on).

As for radical sociology of science, it is true that Chalmers, for the most part, disassociates himself from this movement. But there is plenty of material in the later chapters of the book, especially in the first two editions, that sounds pretty close to it (as much as one can make sense of the sludge in these chapters). And certainly his general view gives license to the sort of views put forward in radical sociology of science (for the reasons Stove identified in *Anything Goes*).

There are three possible interpretations of Campbell's attack. He has either

1. not read the book,;
2. read it a long time ago and has since associated it with a highly demonised radical sociology of science; or
3. completely misunderstood the book.

It's hard to believe that a friend of mine could resort to puerile debating tactics such as wondering whether I have even read the book. (If David was really interested in whether I had, he could have asked me.) As it happens, I recently re-read the first two editions, and I read the third when it came out. Whether David understands the issues is another matter.

While it is true that the latest edition

contains somewhat less of the nonsense that the first two editions do, the libraries are full of multiple copies of the first two editions, and anyone who is advised to seek out the book, especially students, will most likely find themselves with one of those editions.

Chalmers is anti-realist only in the sense that Plato is anti-realist. Both simply recognise that we access the world through our senses, and that direct knowledge of the world is therefore impossible. That is not to say that reality is an illusion...

Dear oh dear oh dear. Has classical education really sunk so low? Talk about shooting yourself in the foot. If Chalmers is anti-realist in the sense that Plato is, then I rest my case. Plato held that the world we 'access through our senses' is **not** fully real, but is a 'pale shadow' of what is (namely, his silly eternal 'Forms'). Plato also held that knowledge of what really does exist does not come through the senses at all, but is *a priori*. Chalmers' view may be a misguided one, but it isn't in any way comparable to Plato's.

...we have no absolute foundations on which to base a knowledge of reality... The second strategy [for dealing with this supposed fact] is simply to accept the problem but carry on regardless. We obviously do have knowledge of the world, but how, fundamentally, we come to have it will always remain something of a mystery.

This sort of view is very prevalent in History and Philosophy of Science departments, as well as Science and Technology Studies departments, and it's exactly why the likes of Popper and Chalmers have been such a bad influence. There is no mystery about how we gain scientific knowledge about the world - unless, that is, you accept Popper's rejection of inductive reasoning, as Chalmers explicitly does, in which case you cannot possibly explain how we come to gain scientific knowledge (or ordinary knowledge, for that matter). So of course in that case scientific knowledge will be a complete mystery to you.

And that will leave you totally unable to explain why science is a better route to knowledge than creation 'science' or astrology or voodoo or reading chicken entrails or sticking your head up your own bum. The logical consequence of Chalmers' rejection of induction is in fact Feyerabend's 'epistemological anarchy', a position which Feyerabend - who Chalmers sadly still regards as a serious thinker - reached on no other ground than

Popper's acceptance of Hume's argument against induction.

Presenting the problem and concluding that there is no way of resolving it does not make one an anti-realist, just as those who point out the flaws in capitalism are not necessarily Marxists."

The rejection of induction entails, as Popper and Chalmers claim, that our beliefs (and not just our scientific beliefs, but our common sense beliefs as well) have a zero probability of being true. If that isn't anti-realist in its consequences - Popper's insistence that he is a realist notwithstanding - then it will do until the genuine article comes along.

My claim that Chalmers is an anti-realist, though, was in fact based on Chalmers' own view, which he calls 'unrepresentative realism', according to which scientific theories cannot describe reality. (Exactly what this view of Chalmers' ultimately amounts to is not clear, because it is so vague, but then in Chalmers' mind this vagueness "is not a weakness but a strength of my position".)

Finally, it must be noted that the latest (third) edition of *What is This Thing Called Science?* bears little resemblance to the previous two editions.

This is rubbish. There are certainly some differences, as well as some notable additions (and it should also be noted that Chalmers makes some amazing concessions to inductivism in this edition, which he soft-pedals, such as acknowledging that the Humean argument against inductivism - the foundation stone of his whole work - has little force.) But there is still a mass of similar stuff in all three editions. In particular, the work still contains the hopelessly ambiguous material on the 'theory-dependence of observation' in the first part of the book, which Chalmers relies on so heavily.

It reflects the changes in thought over almost three decades of one of the few remaining members of an almost extinct species -- the historian and philosopher of science.

Despite David's claims, the species is in little danger of dying out. A species which Chalmers is a member of, and which thankfully *is* dying out, is the conflater of the history of science with the philosophy (or logic) of science. This tradition was started by Popper and was continued most prominently by Kuhn, Lakatos and Feyerabend, as well as by Chalmers.

Scott Campbell
UNSW

About our authors

Sidney Bockner is a psychiatrist practising in Adelaide. His article is based on a paper he presented to a recent Skeptics meeting.

Peter Bowditch should be pleased that we managed to spell his name right in this issue. He is a member of the committees of NSW Skeptics and the Australian Computer Society.

Paul Brown, at the time of writing, was a statistician living in Canberra. He is now a postgraduate student at the Reading University, UK.

Richard Cadena, Californian by birth, Victorian by choice, does things with computers we'd rather not know about.

Jason de Moiser posted his story of his childhood confrontation with a charlatan to our web site.

Laurie Eddie is both a psychologist and the treasurer of Skeptics SA, which seems apt.

Derek Freeman is Emeritus Professor of Anthropology at ANU. He was named as our inaugural Australian Skeptic of the Year in 1996.

James Gerrand was a founding member of Australian Skeptics and is an engineer and a football fanatic.

Rob Hardy, a psychiatrist, recently retired from the US Air Force. During his service he spent several years at the notorious Wright Paterson base, but denies that he ever treated any little grey aliens.

Peter Hiscock is an archaeologist at ANU. He was a speaker at our annual convention in Canberra in 1988.

Richard Lead, accounting superstar and treasurer of the NSW Skeptics would like it to be known that his name rhymes with "dead" and not "weed".

Miles MacLeod is a law student with a background and a strong interest in science. This is something to applaud and we commend it to all lawyers.

Timothy Mendham, or "I'm Mandy the Moth" as he is better known in cryptic crossword compiling circles, compiles our cryptic crossword.

Bob Nixon, a business analyst with a large oil company is also Chief Investigator for *the Skeptic*. One of his major successes in the latter field was the discovery that "oils ain't oils".

Mark Newbrook is a linguist at Monash University who uses his professional skills to expose many dubious claims.

Carol Oliver is the Executive Officer of the SETI Australia Centre at the University of Western Sydney. She was a speaker at the Adelaide conference last year.

John Paterson, before he threw it all in to become an e-psychic, was a project leader with a major computer company.

Ian Plimer, the drinking woman's sex symbol, is a geologist by profession and a puncturer of pretentious pseudoscientific poppycock by inclination.

Steve Roberts is a cryptographer (he measures burial sites, we think) and inveterate collector of trivia. He is also a contributing editor to *the Skeptic* and edits the *WatsOnWare* insert.

Rosemary Sceats, teacher, bard and Vic Skep treasurer, works for a large firm of accountants.

Tony Trimmingham is the founder of Family Drug Support. He is an accountant and he and the editor of *the Skeptic* worked together for the same company in the 1970s

Barry Williams, editor and world traveller, is suffering from progressive vitro-spheroidal deficiency. Our non-psychiatric readers would recognise this condition as "losing his marbles".

Gift Subscriptions

Our special Gift Subscription offer contained in the last issue bore considerable fruit, so we have decided to extend the offer throughout the year.

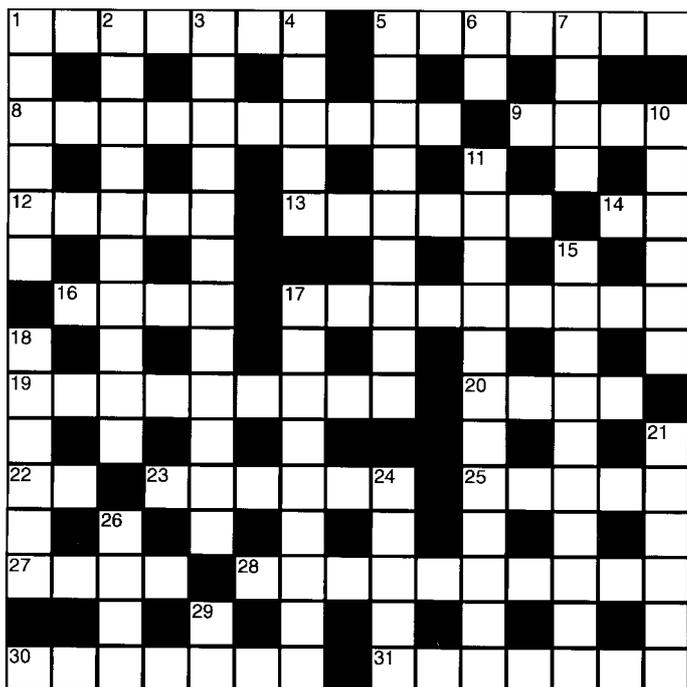
A subscription to *the Skeptic* makes an ideal gift for birthdays, wedding anniversaries (hmmmm?), birth of a child (lay down a hogshead of skepticism for the infant), passing exams (or driving tests), anniversaries of famous battles or first performances of famous symphonies. Almost anything really.

Take out a Gift Sub for a loved one (or even someone you'd quite like if only he would stop whistling off key) and we will send them four back issues of the magazine plus a tasteful card with the message of your choice.

Just send us the sub, the recipient's name and address, plus any message you wish, and we'll do the rest.

What's in it for us? Well we would like to increase the subscriber base and we've found that Skeptics begot Skeptics.

The Skeptic Cryptic Crossword No 6 - Autumn 2000



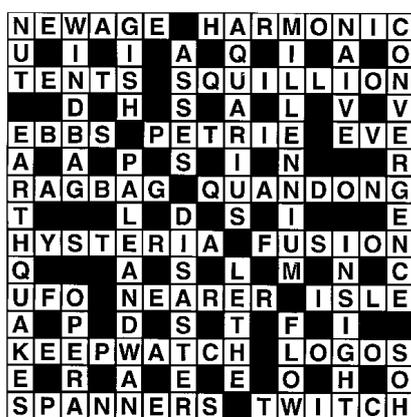
Return to: Skeptic Xword
PO Box 268, Roseville 2069

Name: _____

Address: _____

Entries will not be opened until May 1 and the first correct entry opened will be the winner. The prize will be a book by Richard Dawkins.

Solution to Crossword No 5



The winner of of Crossword No 5, and a copy of Richard Dawkins' *Climbing Mount Improbable* is George Smith QC of Castlecrag NSW.

We were somewhat underwhelmed by the responses to No 5, which we put down to overenthusiastic celebrations of the arrival of the pseudomillennium by our readers. Or perhaps it was too difficult.

Across

1. Each kind was created differently? Not according to this biologist. (7)
5. Philosopher assuming his sums are reversed. (7)
8. Radical change is a gradual change to the right. (10)
9. Shakespearian bowdleriser rubs the balm around. (4)
12. Is 9 across heard to be another creed? (5)
13. Illness felt in the oriental sauna? (6)
14. Mother has a higher degree. (2)
16. Ann concealed her love for an unknown person . (4)
17. Lo, this is a way to get the vessel under way. (5,4)
19. Nixon at it to find a remedy. (9)
20. First man to suffer a blockage. (4)
22. Genre in San Francisco. (1-1)
23. Solemn youngster into sly grog. (6)
25. Yield to a relative. (5)
27. Tidal attraction found in one apple. (4)
28. Poor transportation lost the baby. (10)
30. Naturalist or Hadrians chief architect? (7)
31. Perpetual appeal of Ern, *et al.* (7)

Down

1. The Territory's capital naturalist. (6)
2. Oscillate a piece of timber in the metre band. (10)
3. Mystical group on the light. (12)
4. Mythic evildoer got sunburnt in Adelaide? (5)
5. Inheritance theory makes nuts froth [really].(9)
6. Publicity for the Christian period. (2)
7. Late birds from Missouri and American Samoa? (4)
10. 1 across' doggy conveyance. (6)
11. It is war, Pierre. (4,2,6)
15. Inheritance theory makes an Ark animal unlikely. (10)
17. Supporter's supporter. (9)
18. Elementary DNA man hears the current events. (6)
21. Fix the Spanish geneticist. (6)
24. Crean is not the mother of Pearl. (5)
26. Adam must have lost it in the Autumn. (4)
29. The old god of British art. (2)

Deadline for the next issue is May 1.

Contributions may be sent by email, or mailed on floppy disc (most formats) or clear printed hard copy to:

The Editor
Australian Skeptics
PO Box 268
Roseville NSW 2069